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MEDICAL ASPECTS OF THE EFFECTS OF ATOMIC EXPLOSION

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NOTE: *The author makes no claim to originality in the material presented below. It represents his own personal views and not necessarily those of the Department of National Defence. He has never seen an atomic bomb burst, nor has he had an opportunity of observing the effects of total body radiation upon man or experimental animals. Free use has been made of material published by competent observers, in particular a message from the Surgeon General of the United States Army, entitled, "What You Should Know About the Atomic Bomb"; the lectures by experts of the American Armed Forces and of the Atomic Energy Commission given at a course on the Medical Aspects of Nuclear Energy in Washington; the publications of the U.S. Strategic Bombing Survey, and the reports published by Lieut.-Comdr. E. P. Cronkite, M.C., U.S.N., and others, on Project NM 007 039. The value of this and other source material is gratefully acknowledged.*

IT is the object of this paper to discuss the medical aspects of the *effects* of atomic explosion.

When an atomic bomb explodes, great quantities of energy are released in the form of heat, light, blast, and radio-activity. The effects of this will vary, depending upon whether the bomb has been exploded in air, as it was in Hiroshima, Nagasaki, and Test Able at Bikini; or under water as it was in Bikini Test Baker. For the most part the effects of explosion, discussed in this paper, are those which were observed in Japan following VJ Day, but the effects on experimental animals are also taken into consideration.

The effects of explosion might conceivably be intensified by using a larger bomb than those which were exploded over Japan. These were equivalent in blast effect to 20,000 tons of high explosive and contained between 2 and 50 kilograms of plutonium. However, certain factors make it unlikely anything much larger than this will be used in the future. In the first place, in the atomic bomb, two sub-critical masses of fissionable material are suddenly brought together to form a mass of critical size which explodes. These two masses must each be limited in size to the subcritical mass. Secondly, it would not be economical to increase the size of the bomb very much. For example, 40,000 tons of high explosive will not have as great an effect as two loads of 20,000 tons each.

We can be reasonably confident then that explosion of any atomic bomb in air is likely to have roughly the same effects as have been observed in bombs already exploded over Japan. Let us now examine these effects more closely.

BLAST

The atomic bomb was originally designed as a blast weapon and its only tactical employment to date has been as a blast weapon. The atomic explosion differs from an ordinary bomb blast in the extent of its range. It does not have the trip-hammer blow effect of high explosive, but is rather like a violent, sudden gust of air that lasts for a brief but appreciable period. It is so strong that ordinary buildings will be destroyed within a distance of 1 mile from ground zero, and heavy damage is done within 1½ miles from ground zero. In Hiroshima, the limits of blast damage extended some 8 miles from centre, where glass windows were broken.

The extent of blast damage to structures is limited to some extent by the nature of the terrain. Thus, a city situated on a flat plain would be harder hit than one protected by hills. It is also limited by the type of building; reinforced concrete buildings are more resistant than wooden houses. It is also limited by the height at which the bomb is exploded. At Nagasaki, where the Japanese estimated that the bomb exploded 1,800 feet above ground, 10 square miles were hard hit by blast. At Alamogorde, where the first experimental bomb was exploded 100 feet in the air, less than 3 square miles were damaged to the same extent. It must not be thought however, that the higher

the bomb is exploded, the greater the ground damage will be. Beyond a certain height, the distance of air zero to ground zero becomes so great that the effect of the bomb is lessened.

Primary blast produces casualties in its own right, but these are less than might be expected. Although there are some reports of bodies which were blown open by the blast, in general, Japanese medical observers on the spot could not find any persons with direct damage to the internal organs. Necropsy of cases dying early showed no evidence of blast damage to the lungs. Although many persons reported having lost consciousness temporarily, with no direct trauma to the head, observations tend to discount cerebral concussion resulting directly from blast as a cause of this. One report shows a total of 17 ruptured eardrums discovered at Hiroshima, and 22 at Nagasaki.

Secondary blast injuries.—Of more importance are the mechanical injuries, which result from flying or falling glass, timbers, bricks and other debris. Wooden buildings are completely collapsed within a radius of 1½ miles and glass windows are broken within a radius of 8 miles. Between radii of 1/3 and 1/2 miles, the incidence of mechanical injury was 60% and continued at a high level up to a radius of 1.7 miles. At 2.8 miles it was still 14%

Exactly how much of the total mortality in Japan was due to this factor will never be known, as fire swept both cities before rescue operations could be commenced. However, it is reasonably estimated that 50 to 60% of the deaths were due to direct and indirect effects of blast. The injuries produced by this type of trauma are fractures, contusions, and lacerations. In one military hospital in Japan the distribution of these injuries was as follows: fractures 11.5%; contusions 53.8%; lacerations 34.7%.

THERMAL INJURIES

When the bomb explodes, vast quantities of radiant energy are released. This covers the entire width of the spectrum, including ultra violet, visible and infra red radiation. None of these three has a high degree of penetration, but an intense heat is produced on the surface of any object struck by them. This is particularly true of dark coloured objects. This heat is so intense that in Japan, the wood in dark coloured telephone poles was superficially carbonized 2 miles from ground zero, and burns of unprotected skin occurred 2½ miles from ground zero. Naturally, numerous fires are produced in buildings or the ruins of buildings. Thus, thermal injuries are produced in two ways—flash or ray burns, produced by the action of radiant energy; flame burns, produced by secondary fires.

Flash or ray burns. — Because of the low degree of penetration of the rays responsible for this type of burn, any solid object in their path produces a "shadow" with protective effect. Normal clothing is protective beyond 1 mile from ground zero. Because dark colours absorb more heat than light colours, light coloured clothing is more protective than dark. The stencilled pattern of some skin burns showed this. Thick clothing or multiple layers are more protective than thin or single layers.

Direct injury to the eye is uncommon because of protection given by the supraorbital ridge and the blink reflex. Transitory blindness lasting about 5 minutes, presumably due to brightness of the flash, is common.

These flash burns have certain interesting characteristics. They are profile burns, affecting only that surface of the skin which is directly exposed to the ray. At a distance of about 1 mile from centre, the burns were preceded by intense erythema, which was followed by a marked increase in pigmentation. Surrounding the zone of hyperpigmentation is a sharply defined area, which is depigmented due to absence of melanophores which have wandered into the hyperpigmented area. At a lesser distance from centre, the exposed area may be entirely depigmented, due to destruction of pigment cells. Among the Japanese, these burns were usually followed by keloid formations, sometimes extreme. This may be a racial factor, although this is denied by Japanese physicians. Beyond a distance of 2 miles from centre, few burns required treatment. The symptoms associated with the burns tend to show a fairly definite pattern. In individuals close to the blast, both burns and blisters were apparent in 5 minutes. At about 1 mile from centre, burns appeared in 2 hours and blisters in 4 to 6 hours. At 1¼ miles burns appeared in about 3 hours and blisters in 10 hours.

Flame burns.—Produced as a result of atomic explosion, differ in no way from similar burns

produced by other causes. Non-fatal injuries, due to these, were not common in Japan, as the fires that were started took some time, perhaps an hour, to spread within the city. Thus, those who did not escape were burned to death.

It has been reasonably estimated that burns of one kind or another caused 20 to 30% of the deaths in the Japanese bombings.

RADIATION INJURY

The injuries inflicted by blast and heat which have so far been discussed are familiar to medical officers who have served under conditions of conventional warfare. A new note is introduced by a discussion of the effects of ionizing radiation. This effect has caught the popular fancy and has been much publicized. It should, however, be stressed at this point that from the point of view of casualty production, this effect of the atomic bomb is the least important. We have already stated that it is reasonably estimated that blast produced 50 to 60% of the deaths in Japan, and that burns produced 20 to 30%. Colonel Stafford Warren, who investigated the problem in Japan shortly after VJ Day, estimated that radiation was responsible for only 7 to 8% of the deaths. Most medical investigators who spent some time in the area feel that this figure is far too low and that an estimate of 15 to 20% is nearer the truth. In addition there was at least an equal number of radiation casualties who survived and many thousands who were affected by gamma rays in insufficient amount to produce illness.

It is not intended to minimize the effects of radiation. The problem is an important one, not only because of its relative newness in warfare, but because it complicates the handling of other casualties produced by the atomic bomb. It is only desired to point out that in an air explosion of the bomb, radiation effects are less important than the effects of blast or burning.

Primary radiation.—When an atomic bomb explodes ionizing radiation is instantaneously produced. This is in the form of alpha and beta particles, slow and fast neutrons, x-rays and gamma rays. The alpha and beta particles have small range and low penetration. Thus they do not form a serious hazard to health if they come from an external source. If, however, radio-active materials are taken into the body by ingestion or inhalation, these tend to be concentrated in the bones. Under these circumstances, alpha particles which are emitted from them have a very damaging effect upon bone marrow.

Neutrons have a great range and a high power of penetration. They will travel 1,500 metres through air. They are stopped most effectively by substances of low atomic weight. Thus, materials containing a large proportion of hydrogen atoms are most effective. The half-thickness of any material is that thickness which will reduce by one-half the amount of ionizing radiation passing through it. Against neutrons, the half thickness of steel is between 3 and 12 inches; of concrete, earth, and wood, about 6 inches; of water, 6 inches. Neutrons will render radioactive many familiar elements, such as sodium or carbon, against which they impinge.

Gamma rays also have a great range and a high degree of penetration. They are best arrested by materials having a great weight in relation to volume. Thus lead forms a good protective material. Against gamma radiation, the half thicknesses of materials commonly used in construction are: steel, 1 inch; concrete, 3 inches; wood and earth, 4 inches. Gamma rays, like neutrons, will render radioactive many elements against which they impinge.

X-rays are similar in effect to gamma rays, but have a lesser degree of penetration.

Fission products.—A great variety of radioactive elements are produced from the atomic bomb when it explodes. These fission products are carried upward in the "atomic cloud" by the heat that is produced and are carried off by the wind. They gradually settle out over large areas of country where they emit radioactivity, for varying periods of time, depending upon their rate of radioactive decay. If the dispersal has been wide enough and the dilution great enough, these fission products do not form a serious health hazard. However, if they are concentrated they may render the contaminated area dangerous to inhabitants.

Secondary radioactivity.—The bombardment, principally by neutrons, of many familiar materials found in nature and used, for example, in buildings, will render them radioactive. A combination of this induced activity, together with the activity of any fission products which

may be deposited in the area of the explosion of an atomic bomb will render the area dangerous to life for a period which depends upon the rate of radioactive decay of the elements concerned. Secondary radioactivity, while forming an additional menace to the life of individuals in the vicinity of an atomic explosion, does not seriously impede any rescue operations which might normally be attempted. Secondary radioactivity from ground and normal structural materials will have decreased to below the dangerous level within 2 minutes of the instant of explosion.

Biological effects of ionizing radiation.—Ionizing radiation has a detrimental effect upon tissues. The particular effect varies with the intensity and duration of the radiation, and with the type of tissue which is radiated, but is always harmful. Tissues vary in their sensitivity to radiation. Thus, in decreasing order of sensitivity are listed: (1) lymphoid tissue, bone marrow, lymphocytes, lymph nodes, Peyer's patches; (2) polymorphonuclear leukocytes; (3) epithelial cells of the gonads, salivary glands, skin and mucous membranes; (4) endothelial cells, blood vessels, peritoneum; (5) connective tissue cells; (6) muscle cells; (7) nerve cells.

In considering the effects of atomic bomb explosion, we are chiefly concerned with acute total body radiation.

Tolerance levels of dose. — Experience with x-ray and radium in diagnosis and therapeutics has developed levels of radiation which are tentatively considered safe to absorb over long periods. This has been set at 0.1 roentgen per 24 hours. The lethal dose is also fairly well established, 600 to 800 roentgen, total body radiation will produce 100% deaths; 50% deaths may be expected at 400 to 450 roentgen. Total body exposure to 50 roentgen will produce clinical evidence of radiation sickness.

At the epicentre of the explosion, the quantity of ionizing radiation is many times in excess of the lethal dose, but decreases as the distance from epicentre is increased. A lethal dose is found within a radius of about 1 1/3 miles from epicentre, and a dangerous dose is found out to 2 miles from the epicentre.

CLINICAL EFFECTS

Skin.—Epilation is common among exposed persons who survive more than 2 weeks. It was seen among 75% of individuals who were within 500 metres of the epicentre. It occurs on the 13th or 14th day after exposure. The hair falls out in bunches while combing, or it may be found lying loose on the pillow. The distribution is usually that of an ordinary baldness, involving the frontal, parietal and occipital regions. The temporal region and scruff of the neck are spared, as are the eyebrows, eyelashes and beard. Complete epilation is not necessarily associated with a bad prognosis. On the other hand, 14% of the individuals who died during the 4th week had no epilation. Such cases were probably shielded from the softer rays, which produce epilation, and died of the effect of harder, penetrating rays which had little effect upon the skin.

Even with severe epilation, in cases which survive, the hair begins to return about the 10th week after exposure and is fully returned 2 to 3 months later. In no case reported has epilation been permanent.

Gastro-intestinal tract.—This tract is one of the first to show gross lesions. Vomiting is a common early symptom. In many cases it occurs as early as 30 minutes after exposure. In other cases it does not appear until the following day. In Japan 32% of individuals within 1,000 metres, and 23% between 1,000 and 1,500 metres, vomited on the day of the bombing. Diarrhœa is common within the first few days. In many cases this is sanguineous, probably due to ulceration of Peyer's patches. Ulceration of the tongue, larynx, œsophagus and intestines occurs early. Later, in 3 to 4 months, an enteritis usually of the large intestine, may be found. Pseudo membrane formation and ulceration produce a picture much like that of bacillary dysentery.

Gonads.—Radiation effects are discernible in the testis as early as the fourth day, and are profound in all fatal cases within 1,500 metres of the bomb. The earliest change is necrosis of the germinal epithelium. In survivors, during the 3rd and 4th months, the damaged germ cells are replaced with Sertoli cells. Sperm counts were done on 23 Japanese patients who were within 1,500 metres of epicentre. Only 3 had counts in excess of 40,000 (lower limit of normal).

The ovaries show a less striking change. Amenorrhœa is common for 3 to 4 months following the bombing, but is not permanent.

Absence of developing follicles is a common early finding.

Hæmatopoietic system.—One of the most striking effects of radiation is found in the hæmatopoietic system. The lymphoid and hæmatopoietic tissues undergo rapid necrosis. The early hæmatological response of man to single intense exposure is not well known because the early blood changes were not carefully observed in Japan. The response of laboratory animals is quite uniform, and if due attention is paid to possible differences in sensitivity and rate of changes in the peripheral blood, these results may be applied to man.

In rabbits, shortly after exposure, there is a decrease in the total lymphocyte count which is most marked within 24 to 72 hours, depending upon the amount of radiation received. Simultaneously, there is a moderate granulocyte leukocytosis which appears in 2 peaks, approximately 12 to 24 hours after exposure. After the 24 hour peak, there is a progressive decline in granulocytes for the next 6 days. There is then a fleeting increase in granulocytes, which is short-lived, and the granulocytes again decrease. The subsequent course depends upon whether the exposure is lethal or non-lethal. In non-lethal cases about 15 to 17 days after exposure a small but sustained increase in granulocytes occurs. Reduction of platelets and red cells appears more slowly and is not so uniformly observed.

In man, according to the Japanese, the lymphocyte count drops immediately and reaches the low point in 5 days. A few days later granulocytes begin to drop and at the same time lymphocytes begin to recover. At about the same time the red cell count begins to fall. About the end of the 3rd week, in many cases, there is recovery of the lymphocytes with a marked decrease of granulocytes and an associated anæmia.

Hæmorrhage.—Hæmorrhage is a very common finding, not only in the skin, but in the internal organs. In the skin hæmorrhage is most common on the upper half of the body. Purpuric spots appear about the same time as epilation, and reach their peak between the 16th and 22nd days. Associated with these is an increased tendency to bleed from lacerations, fractures and burns. Hæmorrhage of the gums, intestines, nose, urinary tract and respiratory tract occur in that order of frequency.

Several factors are involved in this tendency to hæmorrhage. The platelet count is reduced and bleeding time may be increased, to as much as 46 minutes. Vitamin C levels are low. Bacteræmia is found. Capillary fragility is increased. All these affect the tendency to bleed.

Clinical syndrome.—The course of radiation sickness varies with the severity of exposure. The syndrome may be studied in 2 groups of patients:

1. Patients who die within *2 weeks of exposure.* In this group there is histological evidence of radiation effects in the skin, gastro-intestinal tract, lymphoid tissue, bone marrow and gonads, but these have not been grossly manifested. The total white cell count of the blood is greatly reduced. There is no epilation or purpura. These patients complain of nausea and vomiting on the first day of exposure and this is followed by anorexia, malaise and severe diarrhœa and fever. The fever begins usually between the 5th and 7th days and rises in a step-like fashion until the day of death. Death in delirium terminates the case.

2. *Patients who die later than the 2nd week, or who survive severe symptoms.*—In this group the clinical manifestations of radiation illness reach their acme. Epilation is prominent. Petechial or purpuric patches in the skin are almost always present. Hypoplasia of the bone marrow is marked. The first evidence of the disease is nausea and vomiting on day of exposure, followed by malaise. The patient then begins to improve and feels well until the 14th day when epilation appears. He then again feels ill and the step-like fever appears. At the same time, he may have pharyngeal pain, with ulceration of the gums, tongue and pharynx. Sanguineous diarrhœa is a prominent symptom. The leukocytes and platelets may reach very low levels. In cases which recover, the fever falls gradually and the white cells slowly increase. In fatal cases, the bone marrow fails to recover, the symptoms continue and the patient dies after a long chronic illness. Secondary infection may hasten the end.

DIAGNOSIS OF RADIATION INJURY

Radiation injury can be suspected in all cases in the vicinity of an atomic explosion. Questioning should be designed to elicit information

as to how far the patient was from epicentre at the time of the explosion, and what amount of shielding might have been interposed between him and the source of radiation.

A diagnosis of radiation illness can be made by clinical examination of a patient. The more severe the radiation the easier the diagnosis will be and the earlier symptoms appear. However, at best, such a method is a time-consuming process and it may be quite impractical to carry it out thoroughly in the number of patients with which a medical service will be faced in the event of an atomic attack.

A much superior method is to rely upon some sort of physical instrument, such as a film badge or a pocket dosimeter. To be of use, such an instrument would have to be issued to the entire population of a country expecting an atomic attack, and it would have to be carried by every individual at all times. However, if such an instrument were available and if it were properly used, it would supply to the examining medical officer an immediate and precise answer to the all important question, "How much, if any, radiation has this patient received?" Knowing this, the subsequent fate of the patient can be fairly accurately predicted and patients can be sorted out for treatment purposes.

TREATMENT OF CASUALTIES RESULTING FROM ATOMIC EXPLOSION

No new problems are presented in the treatment of an individual who is suffering from the effects of blast or burn. Fractures must be splinted, wounds closed, and burns dressed in accordance with recognized principles. Many complex problems are however presented when the treatment of thousands of individuals, all suffering from the effects of blast or burn in the same instant of time, is considered. The success of any plan of treatment for such numbers of casualties will depend upon a well organized and efficient medical service, in which the armed forces and civilians must cooperate. This service must have behind it a huge stock-pile of essential medical equipment, an organization of decentralized hospitals and a pool of First Aid and rescue personnel.

The treatment of radiation sickness presents problems when even a single individual is involved, and these are multiplied to astronomical proportions when mass casualties are considered. The problem can be slightly simplified by a system of triage. In the present state of our knowledge, this means that the medical man will be faced with one of the most difficult decisions of his career, namely, a selection of cases for whom treatment is hopeless and to whom precious medical care will not be given, in order that it may be available for those who can be helped. Such a decision can only be made with the aid of the physical instruments mentioned above. We know that an individual who has received acute total body radiation in excess of 600 roentgen will die within 9 to 10 hours. Nothing we can do will save him. For such an unfortunate individual, only palliative treatment should be carried out.

In cases which have been less severely radiated and who have some chance or survival, the treatment is chiefly supportive in nature. In the present state of medical knowledge there is no specific treatment for radiation sickness. Many substances have been used in the treatment of radiation sickness, and found wanting. Thus, protamine and toluidine blue have been used in an effort to combat the heparinæmia which has been described. Folic acid and pyridoxine have been used to combat blood dyscrasia. Rutin has been used to combat vascular damage. Desoxycorticosterone has increased the survival time of irradiated mice, and is at present thought to be a useful substance for further investigation.

None of these substances provides a specific treatment for radiation sickness, but intensive research is continuing and a true specific drug may yet be found. Meanwhile, treatment should be directed to rest and good nursing in order to give the patient the best opportunity to recover, utilizing his own resources. Antibiotics will assist in the control of secondary infection. Concentrated plasma will combat hypoproteinæmia and whole blood transfusion may carry a patient with severe anæmia to the point at which he begins to regenerate his own red cells. These are useful measures and form the basis upon which the treatment of radiation sickness rests.

We have no more right to consume happiness without producing it than to consume wealth without producing it.—George Bernard Shaw (*Candida.*)

THE INCIDENCE OF CONGENITAL DISLOCATION OF THE HIP AT ISLAND LAKE, MANITOBA*

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ISLAND Lake is situated 150 miles due east of Norway House and 300 miles north-east of Winnipeg. Its eastern tip extends a few miles across the Ontario-Manitoba boundary. It is accessible by water routes either from Hudson's Bay via the Hayes and Nelson River systems or via Lake Winnipeg and the McLaughlin River systems. Of course, today all travel is by air except for snowmobile travel in the winter.

In 1906 the first treaty payments were made to the Indians of the Island Lake region by the Indian Affairs Branch. Indians in the surrounding district, hearing of the payments, came to attend. They came from Red Sucker Lake to the north, Stevenson Lake to the west and the Cobham River system to the east. Thus the Island Lake band is made up of three distinct totems including many different families.

At first they gathered only on the north-west shore at Wasigamak; 449 were present at the first treaty. However, with the coming of first the traders, then the churches, and later the prospectors, they have gradually spread along the shores of Island Lake until they form well established settlements on all shores. In the summer they come to Island Lake to receive treaty, make a garden, some to work or build homes. In the winter most of them scatter to trap and fish, some going hundreds of miles to ancestral trapping grounds.

With the establishment of the churches small settlements grew up with schools and teachers. Medical services were introduced by a beneficent government. The polyglot band increased until today they number 1,253.

The senior author first visited Island Lake in the summer of 1940 to attend as the government doctor at the annual treaty payments. He had never seen so many cripples all gathered together in one place outside of a hospital. It was easy to see that a large number of the cripples were cases of congenital dislocation of the hip, some bilateral, some unilateral. Some crawled on their hands and knees, some hopped about like clowns, others waddled like ducks. All accepted with typical stoicism their misfortune as life's lot. They knew no different. Nature had exacted another toll. With the crowding together of small settlements, inbreeding and consanguinity were introduced.

In the period 1940-49 a large tuberculosis program was introduced by the Indian Affairs Branch when the obvious cases of tuberculosis were weeded out but it was not until the summer of 1949 that we were able to do a survey of the cases of congenital dislocation of the hip. That summer, at the annual treaty payments, through the facilities of the Manitoba Sanatorium Board, a chest plate was taken of every Indian at Island Lake. At the same time each case of congenital dislocation of the hip had a pelvic plate taken and a systematic examination. The results of these examinations were tabulated as shown later. After a few cases were recorded we were struck by a seeming hereditary tendency of the condition. This led us to plot out a genealogical tree which is also recorded.

History.—Attempts at useful history taking were hampered, not only by the language difficulty, but more seriously by the lack of insight and education on the part of the natives. Thus, while it was reasonable to conclude that the individuals concerned had never walked without a lurch or waddle, some queries were not reliably answered. It was not possible, for instance, to discover whether those afflicted were late in learning how to stand or walk during infancy. This situation was masked still further by the racial custom of keeping young children laced in a moss bag until well beyond the normal walking age, sometimes as late as three years.

Physical examination. — In general appearance, there were obliquity of the hips and asymmetry of the inguinal, labio-femoral and gluteal folds. The incidence of lumbo-sacral lordosis was variable in unilateral cases, but extreme in the bilateral dislocations, with a corresponding protuberance of the abdomen. The wide perineum was another feature of the bilateral cases (see Figs. 4, 5 and 6).

Mensuration was employed in order to show shortening of the lower extremity and displacement of the greater trochanter of the femur in its relation to the anterior superior spine of the

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* Based upon an investigation conducted under the auspices of the Indian Health Services, Department of National Health and Welfare, Ottawa.

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TABLE I.
SHORTENING OF THE LOWER EXTREMITY—ATROPHY OF THE THIGH

Part measured	*No. hips examined*	*Measurement*		
		Minimum (inches)	*Maximum (inches)*	*Average (inches)*
Total limb shortening in unilateral cases	19	¼	2½	1.3
Shortening above Trochanteric level:				
(*a*) *Unilateral cases*				
Using Bryant's triangle	20	¼	4	1.4
Using Nelaton's line	20	0	3½	1.5
(*b*) *Bilateral cases*				
Using Nelaton's line	20	0	3¾	1.7
Thigh atrophy in unilateral cases approximately	20	0	3¾	1.8

ilium and to the ischial tuberosity. The decreased circumference of arrested thigh development was also measured. These data are given in Table I.

Using Bryant's triangle in unilateral cases, the shortened segment was located above the level of the greater trochanter. The average value of 1.4 inches represented the differences in length of the base of the triangle, that of the affected side being subtracted from the corresponding apparently sound one. In both unilateral and bilateral cases, similar results were obtained by observing the position of the greater trochanter with respect to Nelaton's line. The average displacement was found to be 1.5″ in the unilateral and 1.7″ in bilateral cases. Some hips that were not dislocated were examined in order to ensure that the trochanter is normally on the line.

Case No. 131 (Fig. 1), right unilateral dislocation with a flexion deformity of the hip, together with a bilateral dislocation of knee and ankle joints. This cheerful 45-year old Saultoux Indian has never been able to stand or walk. By crawling on heavy moose hide mitts and knee pads, he has become one of the most successful trappers at Island Lake.

Case No. 171 (Figs. 2 and 3), daughter of No. 131 above. This five year old girl also has a right-sided dislocation. On her mother's side of the family, there are an aunt, a great-aunt, two great-uncles and a great-grandfather, all reported to have walked with an abnormal gait since birth. These photographs show Trendelenburg's sign on the right side and its absence on the left. She walked with a lurch to the right. On the right side there were: limb shortening of 1¾″, thigh atrophy amounting to approximately 2″ in circumference, a thirty degree limitation of abduction of the hip joint, loose passive rotatory movement and telescoping of the thigh. The right femoral head was palpable above, and posterior to, the acetabulum.

Case No. 178 (Figs. 4, 5 and 6), bilateral congenital dislocation in an eight year old. Photographs show the extreme increase of lumbar lordosis with protuberance of the abdomen, the obliquity of the pelvis, the wide perineum, asymmetry of the inguinal and labio-femoral folds and Trendelenburg's sign on the right side. There was also a right-sided lurch in her gait. The following paternal relatives were reported to have walked with a limp suggesting dislocation: an aunt, a great-aunt and a great-grandmother.

Fig. 1

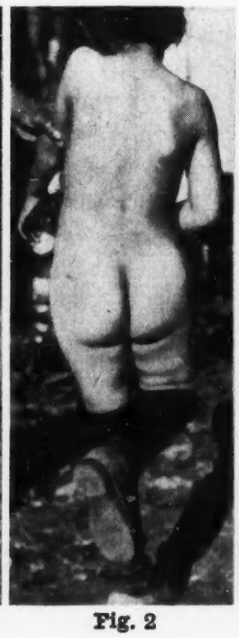

Fig. 2

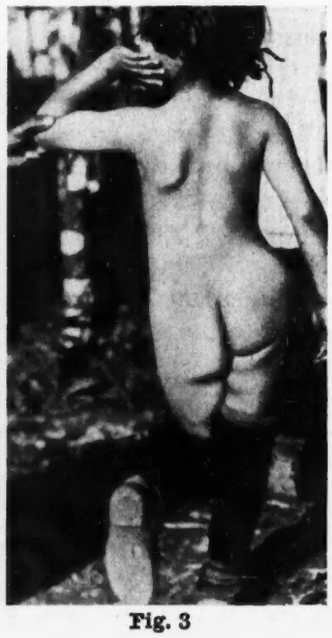

Fig. 3

In fixing the level on the thigh for measuring the circumference, points on the middle third that were equidistant from the respective anterior superior spine were used. Comparison with the apparently sound side showed a decrease of girth amounting to 1.8", on the average.

Table II shows the distinct decrease in the range of abduction. In order to exclude additional limitation due to arthritic changes, the data obtained in the examination of older subjects were omitted from the calculations. This limit was placed at 35 years, since the range of values became considerably less uniform above this age.

Fig. 4

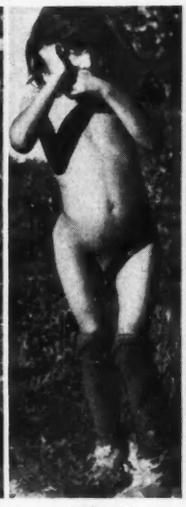

Fig. 5

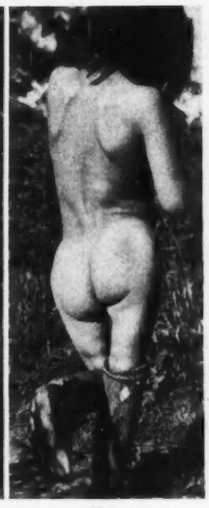

Fig. 6

There was a trend toward increased range of adducation. Normally, it was possible to cross the limb of the side under examination at the middle third of the opposite thigh, but no higher. In *unilateral* dislocations, the affected limb could be crossed at the upper third in about 30% of cases, the others showing little change. In *bilateral* dislocations, the changes were not uniform. Passive rotation in both directions was markedly increased on the affected side in 8 of the 20 unilateral cases examined. In two others, external rotation was nil while in another the limb was fixed in internal rotation. Trendelenburg's sign was present in all unilateral dislocations, with one exception. It was elicited in all bilateral cases. This test is illustrated in Figs. 2 and 3.

Telescopic movement of the affected limb was obtained in six unilateral and four bilateral dislocations. While these were mainly

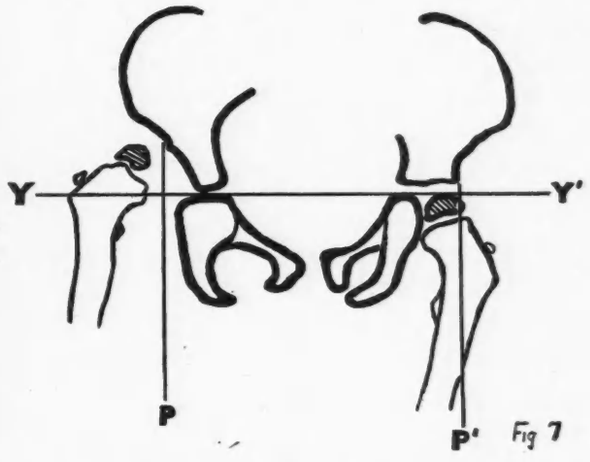

Fig. 7.—Y - Y' is the tri-radiate or "Y" line, drawn through the tri-radiate cartilages at the upper limit of the ischial bones. P and P' are drawn from the outer edge of the roof of the acetabulum. (When the outer edge is effaced, as in acetabular dysplasia, the position of this line where it intersects the "Y" line is found by measuring the distance from the centre of the pelvis to the corresponding perpendicular line on the sound side. The line can now be drawn this same distance from the centre line, which may be represented by the pubic symphysis). Normally, the epiphysis for the head of the femur is in the lower, inner quadrant formed by the intersection of the "Y" line with the perpendicular line on that side. In the case of congenital dislocation, the epiphysis is in the outer, upper quadrant, as shown in the unilateral dislocation above. This diagram was traced from a radiograph of Case No. 167, a three year old female with a left sided dislocation. Her six year old sister has a bilateral dislocation. Her maternal grandfather and his paternal uncle are both reported to have had an abnormal gait.

TABLE II.

RANGE OF ABDUCTION OF THE HIP JOINT
(Hip fully extended)

Condition of hips examined	*No. hips examined*	*Range of abduction*		
		Minimum degrees	*Maximum degrees*	*Average degrees*
Normal	8	30	45	35.6
Normal side of unilateral dislocations	16	30	60	40.6
Affected side of unilateral dislocations	16	20	30	25.6
(Limitation of range of affected side in unilateral dislocations)	(16	5	30	16.4)
Each side of bilateral dislocations	20	20	45	29.0

in the younger age group one 74-year old woman showed at least 2″ longitudinal displacement.

Radiography.—Radiography of the pelvis was taken with the subject standing so there was no correction of the increased lumbar lordosis. Bucky screens, stereoscopic films and arthrography were out of the question. Forty-three films showed hip dislocation. The displacement of the femoral head or its epiphysis above the level of the acetabulum was visible in all the radiographs. In the films of infants, the epiphysis for the head of the femur was external to a perpendicular dropped from the outer edge of the acetabular roof, and was situated above the Y line (Fig. 7).

Differential diagnosis.—Differential diagnosis does not usually present any problem. We may consider however; (1) congenital dislocation of the hip; (2) suppurative arthritis, tuberculosis of the hip joint; (3) coxa vara.

Diagnosis is made by radiographic evidence and the presence of an abnormal gait since the very beginning of ambulation.

ETIOLOGY

1. *Nutrition.*—Has not been shown to be a factor.

1. *Race.*—There is a higher incidence of this disease among certain racial groups, notably the Italians. As far as is known this is the first reference to its predominance among North American Indians.

3. *Occupation.*—Likely of no consequences.

4. *Sex.*—Sex has never been shown to be a factor despite the predominance (1 : 6.5) in females (Table III).

5. *Racial customs.*—It has been pointed out above that Indian mothers keep their babies tied up in a moss bag or waspissoan from birth until three years. It has been suggested this continued position of adduction may cause dislocation. This is not likely as the waspissoan is universal, but congenital dislocation of the hip is not.

6. *Birth injury.*—Probably of no significance.

7. *Heredity.*—After a complete set of notes was correlated, family trees were constructed. These included every individual who had been diagnosed as a congenital dislocation of the hip or who had been reported as having a gait characteristic of this affliction. Forebears shown by the family trees to be common to several cases were retained for the final chart while others were not. The time available was insufficient to permit personal verification regarding all of the siblings.

The genealogical chart shown in Fig. 8 includes 70 living persons who are said to walk with a lurch or waddle. Among these are the 44 individuals whose congenital dislocations were diagnosed by examination and/or radiography (Table III). It is interesting to note that the remaining 26 lurchers and waddlers were placed by the native informants in the same category as the 44 who had been diagnosed.

TABLE III.
SEX DISTRIBUTION OF DIAGNOSED CASES

		Number of cases			
		Unilateral		*Bilateral*	*Total*
Method of diagnosis	*Sex*	*Left*	*Right*		
Radiological and physical examination	Male	1	2	0	3
	Female	7	8	11	26
Radiological examination only	Male	1	1	1	3
	Female	2	1	8	11
Physical examination only	Male	0	0	0	0
	Female	2	0	0	2
Total diagnosed	Male	2	3	1	6
	Female	11	9	19	39
	Both sexes	13	12	20	45
Ratio	Female : Male	4 : 1		19 : 1	6.5 : 1

Note:—In addition to the above cases there are believed to be another fifty cases at Island Lake which we were not able to contact but which fit into the genealogical tree.

The anomalous gait of the additional 23, shown on the diagram, who are deceased, was described by older members of the community who had known these persons. Whether or not any notice should be taken of a diagnosis that is based upon this sketchy evidence, *it is significant to note that every one of these 94 cases is shown by the chart to be connected by blood relationship.* In other words, a consanguinity has been suggested in 100% of cases, as compared with the 20% reported by many authors.

Analysis of the chart revealed that of the 72 cases whose genealogy could be traced for two generations or more: (*a*) 33 had a history of this abnormal gait in both the maternal and paternal sides of the family; (*b*) the maternal side of the family of another was known to be free of the deformity, while the paternal side was affected; (*c*) the remaining 38 had a definite history of abnormal gait on one side of the family, while adequate information about the other side was lacking.

A study of this blood relationship strongly suggests that the primary etiological consideration is the hereditary one. It is the only factor of those mentioned above that can explain the high incidence of the disease at Island Lake, its restriction to certain families and its absence from the other reserves in northern Manitoba. An exception to this last statement will serve to strengthen the thesis: there are two reserves involved in the nomadic migrations of previous generations of the Island Lake people. These are Oxford House, Manitoba, and Sandy Lake in northern Ontario, close to the Manitoba boundary. Congenital dislocation of the hip has been observed at both these places among persons known to be related to the Island Lakers.

SUMMARY

1. In a population of 1,253 Indians at Island Lake, in Manitoba, a diagnosis of Congenital Dislocation of the Hip has been made in 45

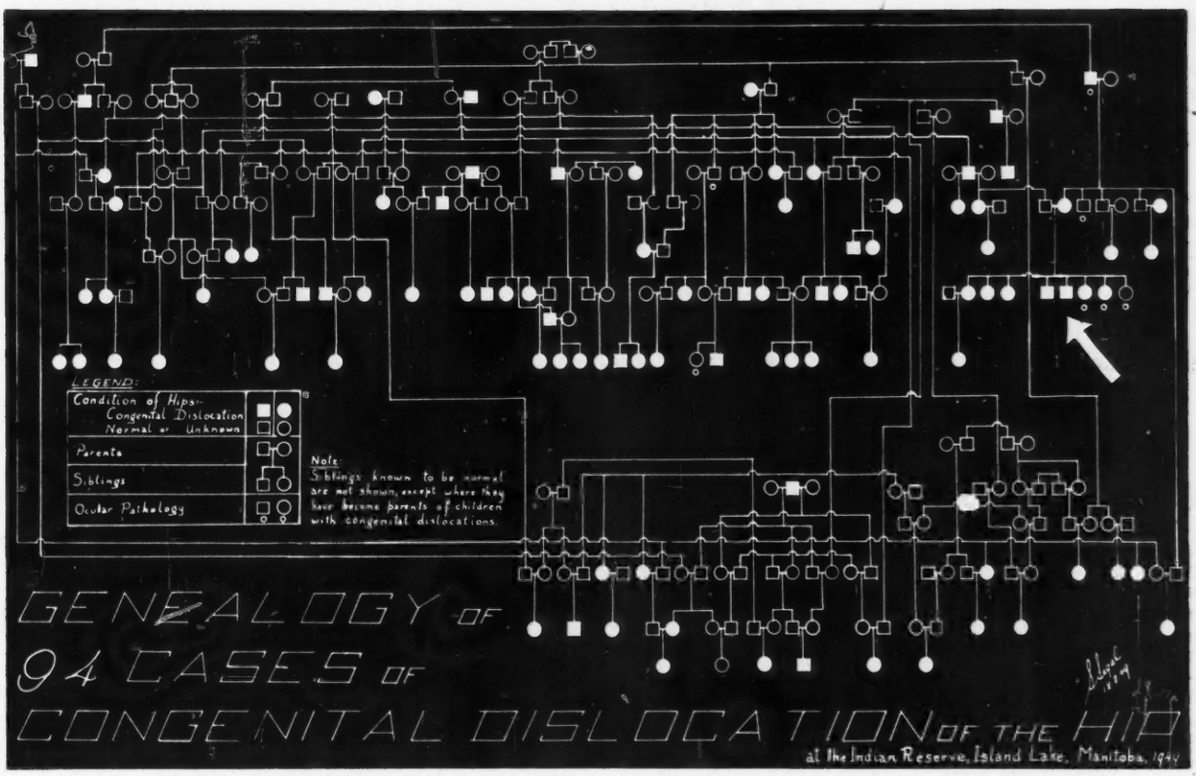

Fig. 8.—Males are represented by squares, females by circles. The incidence of ocular pathology is not within the scope of this paper although it is noted on the chart for other purposes. An example of the interpretation of the chart is shown by following the family marked by the arrow. Here, there are seven affected siblings, two males and five females. The mother and maternal grandfather are affected. The father is not affected but the paternal grandfather was crippled and he had an affected daughter by each of two marriages, and an affected granddaughter by one of them. Looking to the left, it will be seen that this paternal grandfather had an affected sister, an affected brother and his father was also reported crippled.

individuals, ranging in age from two to seventy-four years. There is evidence of other cases that have not been examined, that would bring the total to 71 living persons, representing an incidence of 6%.

2. Diagnosis was made on the basis of a history together with physical examination and/or radiography. X-rays showed the displacement of the femoral head in 43 of the 44 cases. A physical examination was conducted on an unselected group of 31 of those eventually diagnosed, including 29 who had been x-rayed. The physical findings have been described in this paper. The characteristic history is one of a lurching or waddling gait, dating back to the first attempts at walking.

3. The ratio of unilateral to bilateral dislocations was found to be 6:5 in the 45 cases. The proportion of males to females was 1:6.5.

4. A genealogical diagram shows a familial character in the incidence of congenital dislocation in this community. All those who were diagnosed, or suspected of having this disease because of reports of anomalous gait were included, whether presently living or deceased. Thus there are 94 cases, or suspected cases, in the chart.

5. The chart shows that every one of the known or suspected cases of congenital dislocation of the hip at this reserve is connected by blood relationship.

6. Strong presumptive evidence is advanced to show that the primary etiological condition described appears to be the hereditary one.

The authors are grateful for the store of information supplied so co-operatively by the Rev. Father Marius Dutil, O.M.I., Island Lake, and by Mr. Fred Disbroe, Manager of the Hudson's Bay Company Post at Red Sucker Lake, Manitoba. For reviewing the preliminary draft of this report, they are indebted to Dr. G. D. W. Cameron, Deputy Minister and Dr. L. B. Pett, Director of Nutrition, both of the Department of National Health and Welfare, Ottawa. Their thanks are extended to Dr. J. W. Boyce of the Department of Genetics, McGill University and Dr. Allan Bird of the Montreal Neurological Institute for their advice in assessing the pedigree. To Mr. Anthony Samoleski of the Clearwater Sanitarium, The Pas, Manitoba, for his radiological work and to Messrs. Holmes and Kerr of the Biological Photographic Laboratory, Department of National Health and Welfare, for enlarging the photographs and reproducing the x-ray films.

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ADVANCES IN RADIOTHERAPY

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RADIOTHERAPY is a specialized subject, but since there is no branch of medicine which it does not touch, perhaps a discussion of it would not be out of place. It is a very young science and is constantly changing as new apparatus, materials and experience become available.

X-rays were discovered by Roentgen of the University of Wurzburg on November 8, 1895. Contrary to widespread opinion, this discovery does not seem to have been an accident, but the result of carefully thought out experiments. Roentgen immediately realized the importance of his work and in the short space of six weeks he performed an astonishing number of planned experiments. By the use of fluorescent screens and photographic plates he made fundamental observations with such accuracy and thoroughness that other investigators could add nothing until many years later. On December 28, 1895, Roentgen handed his paper, "On a New Kind of Ray" to the President of Wurzburg University. Strangely enough, the first and only time on which he spoke in public on this subject was January 23, 1896. During this month the news of the discovery spread all over the world with amazing rapidity. The peculiar properties of these rays aroused the public imagination and numerous popular articles, humorous and otherwise, were published.

Concern regarding their use became so great in some quarters, that on February 19, 1895, Assemblyman Reed, of Somerset County, New Jersey, introduced a bill into the House of Trenton, New Jersey, prohibiting the use of x-rays in opera glasses at theatres. In London, England, a manufacturing firm advertised the sale of x-ray proof underclothing. It was reported in New York papers that at the College of Physicians and Surgeons the roentgen rays were used to reflect anatomic diagrams directly into the brains of students.

Interest in the new rays was immediately so great that in 1896 over 1,000 articles and 50 books were published on the subject. The medical application of x-rays were quickly appreciated, but for the first five years x-ray apparatus was more an interesting toy than a

weapon of value in medicine. During this period x-ray pictures were put to a variety of uses, the commonest being radiography of bones. As early as 1896 it was suggested that the gastro-intestinal tract could be visualized by the ingestion of opaque substances, and a pregnant woman was successfully x-rayed.

The dangerous properties of x-rays were quickly brought to the attention of early workers by the occurrence of many burns on the hands. This indeed is a tragic chapter, and many an experimenter was maimed or even lost his life through over-exposure.

Following Roentgen's discovery, a Frenchman, Henri Poincare, made the suggestion that it might be interesting to investigate whether or not similar rays were produced by fluorescent and phosphorescent substances. Becquerel undertook a systematic study along these lines. Fortunately he included some uranium compounds among his materials and discovered its radioactivity. Pierre and Marie Curie suspected that mixed with the uranium there was a substance two million times as radioactive. After painstaking experiments and great physical hardships they succeeded in isolating radium in December 1898.

The effect of roentgen rays on the skin was soon observed and this led almost immediately to their therapeutic use in nævus, hypertrichosis, cancer and tuberculosis. The medical press was swamped with accounts of cases treated with more or less success. It was thought that here was the ultimate cure of malignant disease, as of tuberculosis. In the enthusiasm of the time, many physicians installed x-ray apparatus, and not only were patients frequently injured but often the operators themselves developed serious skin changes. In the meantime, observations on radium led to its being used as a therapeutic agent, although it never attained the early popularity of x-rays, since the cost was prohibitive, and the supply very limited. The biological effects of radium were first observed by Becquerel, who in 1901 developed an erythema of his skin, immediately beneath some radium which he was carrying in his waistcoat pocket.

By 1906 the original enthusiasm for the use of x-rays in malignant disease had, to a large extent, been dispelled. It is now recognized that the curative effects of radiation in malignancy is due to the selective action of x and gamma rays on cancer cells. Radiation is lethal to both normal and malignant cells if the dosage is high enough. However, in many kinds of malignancy, a dose can be administered which will kill the neoplastic cells, but will not irreparably damage the normal surrounding cells. The difference between these doses is not great and therefore great accuracy in dosage must be attained to obtain fairly consistent success.

The early workers in x-ray were greatly handicapped by the fact that they had no accurate method of measuring the output from their x-ray tubes. The old gas tubes themselves were most unreliable and varied greatly in output from day to day. In 1919 however, a great advance was made in the construction of x-ray tubes by the introduction of the hot cathode Coolidge tube—an event which revolutionized radiology. Early efforts at the measurement of dosage consisted in the use of photograph methods—that is the degree of blackening of photographic films—and various methods involving the use of barium platinocyanide, which changes colour under the influence of radiation. Unfortunately, all these methods, including the use of the "skin erythema dose", were very rough and ready. They gave no indication of the dosage received by tissues at a depth and their accuracy varied with the experience or inclination of each operator.

With the acceptance of the "r unit", as applied to x-rays in 1928, radiotherapy started to emerge from the long period of empiricism, which had retarded its development. Its medical application was now put on a firm scientific basis. The "roentgen" is a physical measurement of the ionization produced in a certain quantity of air, and can be measured with considerable accuracy. It was not until 1937 that the definition of this "r" unit was broadened to include the gamma rays of radium. It is amazing that in spite of these great basic advances in the science of radiotherapy, there are still some centres which have not adopted them, and which do not have the assistance of a radiation physicist, who is essential in any modern department.

At this stage it is useful to point out how the later development of radiotherapy has been largely brought about by physicists, who have introduced accurate methods of calculating

dosage at a depth, advantageous distribution of radium sources and x-ray fields, accurate dosemeters, and new more reliable and powerful equipment. Radium treatment was revolutionized by the dosage system popularized by Paterson and Parker of Manchester in 1934. This rationalized the use of multiple radium sources and enabled the therapist to judge dosage by the "r" unit, rather than milligram-hours, which in most instances is meaningless, in that the exact dosage received by the tissues is not indicated.

It has long been recognized, that for deep seated lesions, several crossfiring x-ray fields were necessary to deliver a reasonable dose to the tumour. However it was found that when large fields were used, the patient's constitution would not withstand the dosage necessary. It became desirable to use as small fields as possible. There are two kinds of tolerance to x-rays or radium—the local tissue tolerance and the whole body tolerance. The body tolerance depends upon the integral dose, that is the amount of radiation absorbed by the body as a whole. When the limits of this tolerance are reached, we get radiation sickness and leucopenia. The larger the fields, the higher the integral dose. Hence with large fields the limiting tolerance is not that of the skin or other tissues locally, but the resistance of the body. Local tolerance, totally different in origin, is also affected by the size of the fields, but not by the integral dose. The skin will stand a much higher dose from a small field than from a large field. The same applies to other tissues. A small volume of tissue will tolerate a much higher dose of radiation than will a larger volume. Therefore, when we treat a deep-seated cancer and wish to give it a high dose, we should attempt to treat as small a volume as possible. Not only do we want the dose to be high, but also we do not wish to treat more normal tissue than necessary. If we can accurately direct several fields to a deep-seated cancer, and a safety margin round it, we can reduce the size of our fields, a highly desirable end. Methods of attaining this accurate alignment of the x-rays are called beam direction. Many mechanical devices were introduced, but the most accurate method, which has stood the test of time, was developed at the Holt Radium Institute, Manchester, England. This method is applicable to small tumours in the fauces, pharynx, lung, œsophagus, bladder, brain and nasal sinuses.

There appears to be a place for the direct application of x-rays to deep-seated tumours which have been surgically exposed. Over the last ten years, in selected cases, some carcinomata of the bladder and rectum have been exposed, a sterile x-ray cone directly applied and a rapid single treatment given. The wound is immediately closed and heals by first intention, since the overlying tissues have received no irradiation. It is quite feasible to apply the same technique to tumours in the abdomen, thorax, larynx and possibly brain. By a similar method carcinomata limited to one side of the larynx can be treated with a single exposure of x-rays. The thyroid cartilage on the affected side is exposed surgically and removed, care being taken to leave the underlying mucosa intact and not open into the larynx. The x-ray applicator is then applied over the mucosa and an exposure made. The wound is then sewn up and heals quickly.

Inoperable secondary glands can be exposed and a direct application of x-rays made over a wide area. No skin is irradiated and a dose 50 to 100% more than the skin tolerance can be given. It is possible that in the future no major operating room will be complete without an x-ray therapy machine of high output, although the use of this method would appear to be restricted to localized inoperable masses.

In 1934, Irene Curie and her husband, Frederick Joliot, succeeded in producing artificial radioactivity. Nuclei of all elements except hydrogen are thought to be composed of varying numbers of neutrons and protons. The hydrogen nucleus has one proton only. A proton is a positively charged particle, whereas a neutron has no electrical charge, but is of approximately the same mass. If atoms of any element are bombarded by other particles, such as neutrons, protons, or deutrons, some of these will hit the nucleus, where they may remain, or may on the other hand displace some component. In either case, the balance inside the nucleus is disturbed, and the nucleus becomes unstable. In this way an isotope is formed. This isotope emits either a particle or gamma ray or both, in an effort to re-establish its nuclear balance. This is artificial radioactivity. Usually in emitting a particle, the nucleus actually changes from one element to another.

In this way any element can be made radioactive. Now, if a substance could be found which is absorbed selectively by cancer tissue, then it could be made radioactive, and the tumour irradiated exclusively merely by injecting this material into the blood stream. However, no such substance has as yet been discovered. A few cancers of the thyroid (about 1 in 30) are found to have an abnormal affinity for iodine, and several of these cases have been successfully treated by radioactive iodine. It does not matter whether there are secondary deposits or not, since all will abstract the iodine from the blood.

Radioactive iodine is being extensively used in the treatment of thyrotoxicosis, but its place in medicine has not yet been fully evaluated.

Radioactive phosphorus has been used for some time in the treatment of leukæmias and polycythæmia vera. Most workers however, have now abandoned its use in leukæmia in favour of conventional x-ray therapy, but it is widely used in polycythæmia vera.

Phosphorus is taken up most readily by rapidly growing tissues. This fact has been used by Low-Beer in the diagnosis of cancer of the breast and secondary glands near the surface of the skin. A tracer dose of radioactive phosphorus is given, and counts made with a Geiger counter over the suspected areas. The growth must be near the surface, since the electrons, which are given off by the phosphorus, will penetrate only a small thickness of tissue. Unfortunately, inflammatory tissue concentrates phosphorus more rapidly than cancer tissue and therefore it is doubtful that this method has much future. The same principle is being applied to the localization of brain tumours.

Another radioactive isotope, cobalt 60, would seem to have a definite application to medicine. This substance has a half life period of 5 years, and gives off gamma rays similar to those of radium. In a uranium pile, it can be made intensively active. Large amounts can then be mounted in a thick lead container, with an opening in one side, and used in the same way as an x-ray machine. To approach the quality of these gamma rays, an x-ray machine would need to be of 2,000,000 volts. Several of these beam units are now in the course of construction. It is probable that they can be made for about 1/10 the cost of a 2,000,000 volt x-ray machine, and will be more efficient.

Fluorescin is concentrated by tumours of the brain, sometimes as much as 17 times that of normal brain tissues. Use of this fact has been made by George Moore and others of the University of Minnesota in their diagnosis. Fluorescin, containing radioactive iodine, is concentrated in the tumour tissue and by means of a Geiger counter the areas on the skull showing the most activity are marked out. In this way the site and depth of the tumour can be found.

In recent years manufacturers have been building more and more powerful x-ray machines. The most powerful so far built is of 2,000,000 volts. The most powerful used in Canada are below 500,000 volts. One may well ask what are the advantages of higher energy x-rays. It has long been accepted that the biological effects of x-rays (and gamma rays) are the same qualitatively, but that quantitatively there is some variation. Most of the advantages of the higher voltages lie in their physical properties. The higher the voltage the more penetrating the rays, and the greater the percentage reaching deeper parts. Further, with conventional voltages, such as 200,000, there is a considerable difference in the absorption of the x-rays by various tissues. Bone, for instance, will absorb two to three times as much radiation as ordinary muscle or connective tissue mass for mass. Thus when it is necessary to include bone or cartilage in an x-ray beam, the higher the voltage the better, since at voltages of 1,000,000 or more, the absorption of the various tissues is about equal, and therefore there is less danger of cartilage or bone necrosis.

Since 1937 even higher voltages have been obtained by the use of special devices. In an ordinary x-ray tube the x-rays are produced when speeding electrons hit a metal target. The energy of the x-rays produced depends on the speed of the electrons. The speed of the electrons depends on the voltage applied between two poles. In these new devices, electrons, or other particles are accelerated by making them travel in a circle in a changing magnetic or electric field. With each revolution they gain speed, and therefore energy. In this way energies of several hundred million volts have been obtained.

The first apparatus to use this principle was one developed by Lawrence in America. This is called a cyclotron, and in it protons or deutrons are accelerated to enormous energies. When these particles are made to hit certain elements, the nuclei are bombarded, and neutrons ejected. These neutrons were used by Stone in California in the treatment of cancer. This treatment, however, was abandoned in 1943 because of the severe late reactions obtained and it has not been resumed. It is interesting, however, to note that neutrons are absorbed much more readily by fat than by other tissues, and possibly some therapeutic application will be found for them. Another product of the cyclotron, fast protons, will shortly be tried in medicine. These particles produce very little effect in the tissues until they reach a certain depth, where their release of energy is very great. The application of this property to therapy of deep tumours is obvious.

Another device for accelerating particles is the betatron. This is an ingenious machine which gives electrons very high energies without the use of correspondingly high voltages. The electrons are accelerated by making them travel in a circle within the field of a large electro magnet. It is much less cumbersome than the cyclotron which may weigh more than 1,000 tons.

A betatron is operating at the University of Saskatchewan. Its weight is only 5 tons, and it produces x-rays of energy of 25,000,000 volts. The distribution of dosage in the tissues from this machine is interesting. The dose rises from about 15% on the skin to 100% from 3 to 5 cm. deep. Following this the percentage depth dose falls off very slowly. With x-rays of even higher voltage the maximum dose would fall at greater depths. This machine is at present being used in the actual treatment of advanced malignant cases. It is easy, by the use of several crossfiring x-ray beams to attain homogeneous irradiation of deep seated tumours without producing any appreciable affect on the skin. A further advantage is that for a given tumour dose, the integral dose, that is, the total radiation absorbed by the patient, is much smaller than with conventional x-rays. Little or nothing is known of the biological effects of these rays. It is just possible that they may have a greater selective effect on cancer cells than ordinary x-rays, although this is improbable since their biological effect is caused by ionization in the tissues, as with conventional x-rays.

CONCLUSION

It must be remembered that radiotherapy is a young science, with probably a great future in front of it. We must look to physicists for further advances. The fields of radioactive isotopes and supervoltage therapy are being opened to us with amazing rapidity. It is over 50 years since the discoveries of Roentgen and Becquerel. The first 40 years were spent in the developing and harnessing these rays to medical use. The last ten years have seen surprising new discoveries in nuclear physics, the application of which to medicine are only now being investigated.

BERYLLIUM GRANULOMATOSIS

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A NUMBER of cases of beryllium poisoning have been reported in the medical literature of both Great Britain and North America during the last few years. It is interesting to note that this is an industrial and public health hazard which appeared a few years ago and will soon be passed as a new substance is about to be used in fluorescent lighting which will eliminate beryllium and its compounds.

CASE REPORT

H.I., male, aged 29, was referred to one of us (J.G.) on August 30, 1946, because of raised, red, tender scars on the forehead (Fig. 1). He was in a disgruntled frame of mind and felt that his original cuts had been passed along to resident hospital staff and therefore inexpertly handled. The hospital entry of May 6 records that he had been hit with a broken fluorescent bulb, receiving a three-sided cut on the right forehead. A vessel was tied off with catgut and 2% novocaine was injected. The cut was washed with green soap and water and six plastic sutures were used. Sulfa powder and elastoplast dressing were applied. On May 9, the sutures were removed and sulfa powder and elastoplast dressing reapplied. On May 13, the wound was washed with alcohol.

This would seem to indicate better than average emergency care and should have resulted in an excellent scar. On presentation in August, however the scars were epithelialized, but soft, red, tender and raised. The patient grudgingly wondered if the powder used on the inside of the light bulbs might not have something to do with the unsatisfactory nature of the scars and volunteered the information that finger cuts stitched previously had healed well.

The scars were excised and revised under local anæsthesia on September 13 and healing was uneventful with an excellent result. The pathologist reported tuberculous-like granulation tissue. The patient was informed of this but insisted that his health was good and he had just passed an examination for a $10,000 life insurance policy. The conclusion was reached that the forehead lesion was some sort of a granuloma due to the fluorescent powder. He was re-examined on March 17, 1947, when his health was good and the scars were cosmetically excellent.

Pathological report.—Sections (Figs. 2 and 3) consist of a piece of skin and subcutaneous tissue. The surface is covered by an atrophic layer of stratified squamous epithelium showing a thin layer of keratinization of the surface and pigmentation of the basal layer. There are sebaceous glands and hair follicles present.

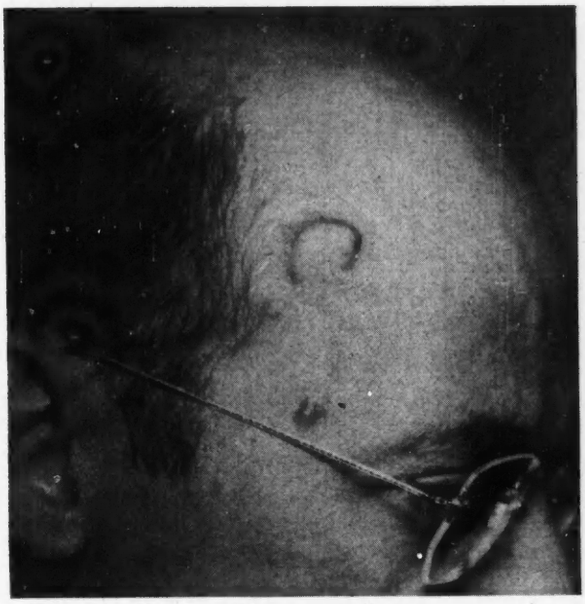


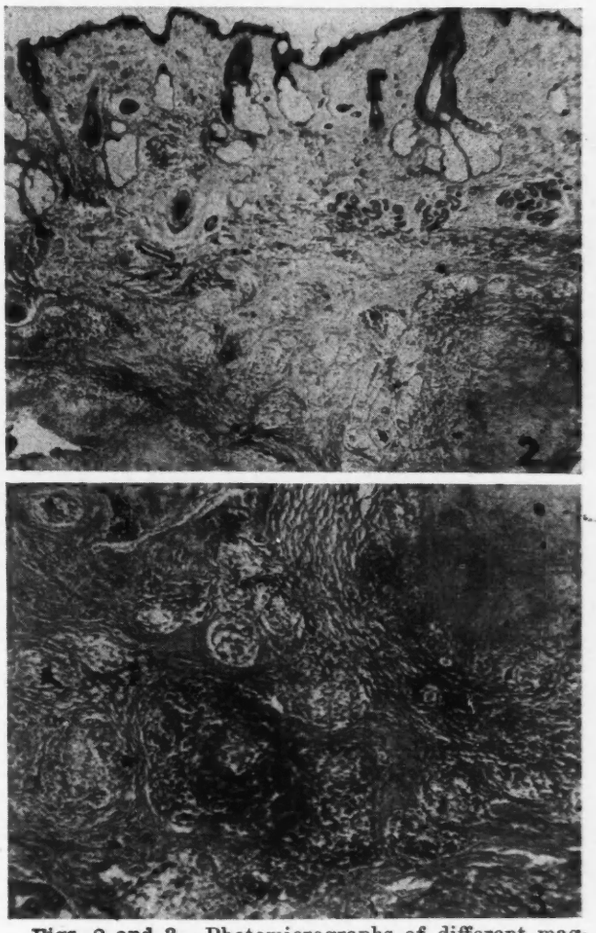
Fig. 1.—The beryllium granulomata, as seen on August 30, 1946, resulting from a cut with a fluorescent light bulb.

Throughout the corium and subcutaneous tissue there are multiple tubercle arrangements of epithelioid cells, in some areas isolated and in others confluent. About these areas there is a varying degree of lymphocytic and plasma cell infiltration, some of the tubercles show multinucleated giant cells, resembling the Langhans type. In the larger confluent areas there is central necrosis that becomes homogeneous and eosinophilic and contains karyorrhectic nuclei. In some others there is a heavy infiltration of polymorphonuclear eosinophiles and some neutrophiles. In other places the necrotic coagulum is fenestrated and gives the appearance of vacuoles at the site of dissolved-out cells. The lesion nowhere involves the papillary zone of the corium but is widespread throughout the reticular zone and extends into the subcutaneous fat. The first diagnosis on this case was a granuloma of the skin of tuberculosis etiology. Stained sections for tubercle bacilli were negative.

In the light of further history and present day knowledge, this conforms to the type of skin granuloma reported as resulting from a type of reaction to beryllium.

Coakley, Shapiro and Robertson,[1] in reporting a similar case, described four types of cutaneous lesions. (1) Contact dermatitis, where the dust of beryllium sulphate, fluoride or oxyfluoride comes in contact with the skin over a period of time. (2) Ulcers due to implantation of beryllium sulphate crystals in a laceration. (3) Cutaneous lesions in patients with pulmonary granulomatosis. (4) Subcutaneous granuloma in cuts made by broken fluorescent lamps, the lesions appearing like sarcoidosis of the skin.

A case is cited of a male sixteen years of age with a history of being cut on the cheek two years previously with glass from a broken fluorescent lamp. The wounds were sutured at time of accident mainly to control hæmorrhage.



Figs. 2 and 3.—Photomicrographs of different magnification showing the "sarcoid" bodies, giant cells of the Langhan's type and general similarity to tuberculous tissue.

Several months later a painful nodule appeared in one wound with intermittent discharge: radiation therapy was used to no avail, and complete general investigation was negative. Finally a wide thorough excision was carried out, after which complete healing occurred. Histological structure of the section was similar to Boeck's sarcoid.

Van Orstrand, Hughes, De Nardi and Carmody[2] report on 170 cases in the Cleveland area over a period of four years, which mani-

fested themselves as dermatitis, chronic skin ulcer and inflammatory changes in the respiratory tract. Some gave naso-pharyngeal symptoms and others progressed to diffuse pneumonitis. There were five deaths in the series. Most cases suffering from pulmonary disease were or had been within three years, workers in beryllium-producing plants. Most cases suffering from dermatitis were found to be chronically exposed to the metal and/or its salts. They make suggestions for prevention, such as safety clothing—masks—adequate ventilation, and properly protected equipment.

Doane[3] reports a case of hand laceration caused by glass from a broken fluorescent lamp. The wound was closed followed by poor healing with a minimal amount of pus discharged periodically from which no growth was obtained. The wound was reopened and search made for a foreign body, but none was found; after closure granulation tissue reappeared, repeated probing and cauterization had no beneficial effect; x-ray radiation was tried unsuccessfully the wound repeatedly breaking down for about a year. Finally wide and thorough excision was followed by healing.

The *British Medical Journal*[4] reports the case of a patient aged 36 engaged in industrial work in contact with beryllium oxide for one year from December, 1941 to December, 1942. In 1945 he complained of a cough and showed loss of weight and died in a London hospital November 4, 1945, from some form of pneumonitis. Necropsy findings showed death due to beryllium poisoning.

From the transactions of the eleventh annual meeting of the Industrial Hygiene Foundation[5] Gardiner reports two clearly different pulmonary lesions due to beryllium and its compounds. (1) The acute type usually clearing in a few days, or it may be primarily fatal; no infectious agent is to be found. (2) A chronic type which may end in death from cachexia or dyspnœa and heart failure. The onset of this may occur as long as three years after exposure. X-ray reveals nodules in the lung uniformly distributed and there may be miliary stippling or lesions may be up to 5 mm. in diameter.

Differential diagnosis from silicosis may be difficult; lack of bone involvement differentiates it from Boeck's sarcoid. It has been named beryllium granulomatosis. Beryllium evidently acts in conjunction with an as yet unknown factor to initiate the pathological process. At autopsy spectroscopic analysis yields one to five micrograms of beryllium per six to seven grams of dry lung tissue.

Brown[6] reviewing the literature in 1946 stated that more than 200 cases had been reported up to that time. The common manifestations appear to be dermatitis and inflammation of the respiratory tract. Eruption on skin appears in most cases to disappear on cessation of exposure. Chronic ulcer resulted from crystals of beryllium within the skin; this healed eight to ten days after thorough excision and curettage of the fibrous base. A large percentage of the cases reviewed had pneumonitis, showing symptoms of cough, occasional blood-stained sputum, burning substernal pain, dyspnœa, cyanosis, abnormal taste and increasing fatigue.

Dutra[7] writing of the pathology of these lesions states that they resemble to some extent those of Boeck's sarcoid—acute diffuse interstitial fibrosis; only rarely are giant cells found at the centre of the lesion and these differ from sarcoid in the great variation in the number of nuclei (4 to 30). Typical epithelioid cells are seldom a part of the granuloma, most have either fibrinoid material or granular necrotic eosinophilic debris at their centres. Moderate numbers of lymphocytes are found even within the central granular debris. There is diffuse intraseptal fibrosis of a type not seen in sarcoid.

A statement[8] from The Medical Advisory Committee of the American Medical Association is to the effect that there is no danger from lamps when they are intact; it is after the destruction of old lamps that lacerations have been reported which were slow in healing, showed swelling and in some cases required surgical treatment. Breathing dust from broken lamps on isolated occasions is not serious but the continuous exposure to it may be. This report includes the following instructions *re* the disposal of worn out lamps. (*a*) Lamps should be broken out of doors in a proper disposal area or under a ventilated hood or in a waste container. (*b*) The operator must use a proper respirator. (*c*) The ultimate disposal of the remains must be such that the public are not exposed to powders or broken glass coated with them. A certain significant

amount of mercury vapour may be found in the surrounding air during breakage.

There were three scientific exhibits on this subject at the recent meeting of the American Medical Association in Atlantic City. H. S. Van Orstrand, Joseph M. de Nardi and Morris G. Carmody presented a nine year study of the toxic manifestations in workers exposed to beryllium and its compounds in over 400 cases. Among this group of cases were all known types of reactions to the compounds including dermatitis, granulomatosis, acute and chronic pulmonary symptoms conjunctivitis and ulcer. Robert E. Kehoe, F. R. Dutra, J. Cholak and E. J. Largent presented the results of work on experimental animals related mainly to pulmonary manifestations, they also found that some of the relatively insoluble compounds given intravenously produced malignant tumours. Raphael Pomeranz, Harry A. Brodkin and Harrison S. Martland, Jr., presented eighty 8 by 10 transparencies demonstrating radiologic, and gross microscopic pathologic studies of four autopsy cases of beryllium poisoning. They demonstrated comparative histologic studies with other pneumoconiosis, silicosis and sarcoidosis. The radiological aspects of the disease are well covered by Pascucci[9] and Wilson.[10]

Machle, Beyer and Gregorius[11] define berylliosis as a general disease characterized clinically by pulmonary insufficiency and with the major changes in the lung. They too describe the characteristic lesion as a granuloma, like that seen in sarcoidosis, and point to the acute and chronic types. Vorwald[12] also recognizes these two distinct types and says the pathological aspects are confined principally to the lungs and trachea. Royston[13] describes a case presenting clinically as bronchiolitis. The x-ray changes were miliary in character and completely cleared in eight weeks without residual fibrosis. Nichol and Domingues[14] present an analysis of the disease in considerable detail with excellent illustrations of the sarcoid bodies. These were taken from excised skin wounds in patients who, already suffering from pulmonary berylliosis, sustained cuts from broken fluorescent light bulbs with the resultant characteristic pattern of indolent granulomatosis. Their spectroscopic analysis of these lesions showed that they contained beryllium while examination of other scars from the same patients contained no beryllium. They postulate no connection between the skin lesions and the previously present pulmonary condition.

The United States Public Health Service announced in their release F.S.A.-571 dated May 6, 1949, "The major manufacturers of fluorescent lights have stated that after June 30, 1949, they will no longer use beryllium phosphor in the manufacture of fluorescent lights". This release also reads "although precautions should be taken against breathing the dust from broken fluorescent lights, there is no record of any person suffering injury from breathing dust from the occasional breakage of a lamp, despite the millions of lights in use". The committee also repeated its original statement "cuts do not cause any general sickness or spread further in the body".

CONCLUSIONS

1. Various beryllium phosphors were introduced in the middle thirties in the making of certain alloys and were used in increasing amounts in the production of fluorescent light bulbs.

2. An industrial and public health hazard has resulted producing granulomatous lesions of the skin and lungs.

3. A case is reported of a typical skin lesion resulting from a broken fluorescent light.

4. With the withdrawal of beryllium from such manufacturing processes, the hazard should pass.

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RÉSUMÉ

Les auteurs rapportent un cas de coupure faite sur une ampoule contenant du béryllium. Cette plaie prit plusieurs mois à guérir et on dut faire une exérèse de la cicatrice qui demeurait douloureuse et rouge. Ils en profitent pour faire une revue de la littérature traitant ce sujet. Le béryllium peut causer des lésions granulomateuses cutanées et pulmonaires, qui ressemblent à la sarcoidose de Boeck. Actuellement le danger est pas mal passé car le beryllium ne fait plus partie de la fabrication des ampoules électriques fluorescentes.

YVES PRÉVOST

FAT EMBOLISM

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A CASE of fat embolism which recovered after developing pulmonary and cerebral complications with hemiplegia stimulated our interest and seems to be of sufficient rarity to merit publication. Experience gained in this case has made it possible to recognize succeeding ones, and a fatal case which gives a clear picture of the pathological findings is included to complete the subject.

CASE 1

A 44-year old healthy female was knocked down by an auto on October 23, at 11.45 p.m. She lay on a cold wet street for an hour before being transported by ambulance to the Winnipeg General Hospital. On admission she was in shock with a blood pressure of 90/50.

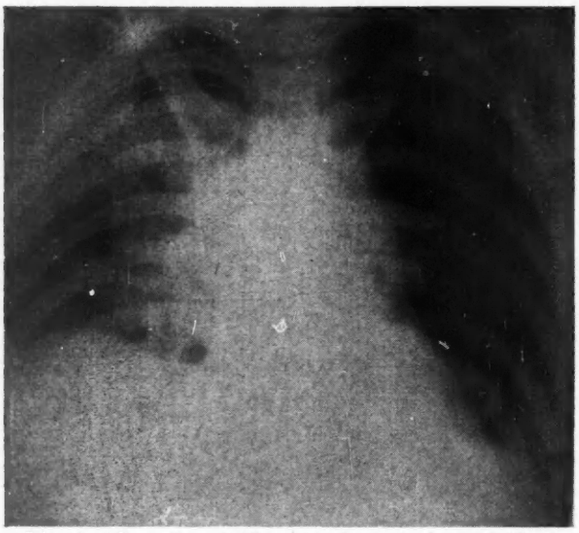

Fig. 1. (Case 1).—Diffuse haziness in lung fields due to fat embolism. (Portable x-ray).

There were compound fractures of right and left tibia and fibula and fractures of both wrists. There had been no head injury and the patient was fully conscious. Abdominal examination was negative and there was no evidence of gross hæmorrhage.

The four fractured limbs were splinted; morphine, plasma and penicillin were given. Four hours later the patient was still in shock but fully conscious. At 8.00 a.m. she lapsed into semi-coma but could be roused and answered questions intelligently. Her blood pressure was 86/56. Blood was given intravenously. Later she became very restless and could not be roused. She began to vomit small amounts of clear fluid and became markedly distended. X-ray showed a greatly distended stomach and first part of the duodenum. This was decompressed by an Ewald tube and by 9.00 p.m. the vomiting had ceased and x-ray showed the stomach to be deflated. The continuous gastric suction was maintained, restlessness continued but the patient could not be roused.

By the end of the first twenty-four hour period 3,000 c.c. of plasma, 1,500 c.c. of whole blood and 500 c.c. of dextrose in distilled water had been given. On October 25, unconsciousness and restlessness persisted and respirations became laboured, irregular and noisy. She was given oxygen because of cyanosis. The blood pressure was now 130/76, pulse 126, and temperature by axilla 101°. X-ray of her chest showed what appeared to be a pneumonic process in both lungs. As the stomach was not distended, the nasal tube was removed. Restlessness continued and was very marked on October 26. She perspired freely but her blood pressure remained normal.

On the morning of October 27, she was taken to the operating room as the splints could not be retained in position because of her restlessness. The fractures were quickly reduced and plaster casts were applied to both legs and wrists. No anæsthetic was necessary. From this time she seemed to improve. Thick sputum was expectorated and in it much free fat was reported. By the afternoon a complete left hemiplegia had developed, and bilateral positive Babinski signs were elicited. She was conscious, complained of double vision and had a divergent squint affecting her right eye. She took fluids and soft solids and her general condition seemed satisfactory.

Improvement continued but her vision was blurred. By November 2, the hemiplegia had disappeared and the plantar response was normal. On November 5, an x-ray of the chest showed the lungs to be clear. Repeated specimens of sputum and catheterized specimens of urine showed a great excess of free fat.

A marked change in her voice (which was almost a whisper) remained for many months. The diplopia remained and she had difficulty in writing, for if she stopped in the middle of a word she could not finish it. The fractures healed without difficulty. Less than a year after her accident she was back at work as a cashier. Now one can detect no abnormality to signify her severe illness.

CASE 2

The patient was a healthy, robust male, 24 years of age. On the evening of November 18, 1948, he fell forty feet down a mine shaft, landing on his feet and hands. He fractured both femurs, right wrist (compound), left humerus, left ankle and the lower jaw in several places. At the mine his fractures were splinted and he was given 1,000 c.c. of plasma and 1,500 c.c. of whole blood. The following afternoon November 19, he was flown three hundred miles to the Winnipeg General Hospital and arrived in very good condition.

His blood pressure was normal; he was taking fluids well and passing his urine without difficuty. His hæmoglobin was 56% and urinalysis on November 20, was normal except for a trace of albumin. His condition was satisfactory but it was felt unwise to carry out any major procedure to remedy his fractures. By noon on November 21, one could note a deterioration in his condition. His pulse was more rapid, breathing more difficult and he gradually became unconscious. His temperature rose from 102 to 104° by axilla. It was felt that he had a fat embolism. Oxygen and whole blood were administered but he died on November 22 at 2.00 a.m., a little more than three days after his accident.

Autopsy.—The brain was normal in the gross except for moderate œdema. Both lungs were large, heavy and dark red in colour and contained very little air; when cut across a dark bloody fluid exuded. In the kidneys no gross changes were evident.

Microscopically: special fat stains showed multiple fat emboli in the brain, kidneys and lungs. These were very numerous in the lung, with much fat being present in the capillaries and in the phagocytes within the alveoli.

DISCUSSION

Fat embolism has been defined as that condition which occurs when a liquid fat enters the circulating blood and is transported in globules large enough to obstruct the lumen of capillaries, especially in the lungs, kidney, liver and brain. It is most usual after trauma, such as

multiple fractures and orthopædic operations, but has been known to occur following injury to soft parts, fatty viscera and burns.

Males are more commonly affected in the ratio of 8:1. This is because they are more subject to trauma. The youngest patient reported was an eight-month old infant after bone surgery. The commonest age is in the fourth decade of life. Fat embolism is rare in children. Reasons advanced are that in children up to the age of 14 there is little fat in the bone marrow, and that there is more palmitin and stearin and less of the fluid fat olein. In Warren's series of 100 fatal cases of fat embolism, 90% followed fractures.

The earliest work on this subject is attributed to Lower, who in 1669 injected milk in large amounts intravenously in dogs and noted the effects. Magendie from 1821 to 1836 performed many experiments on animals. He injected oil intravenously and found that the fluid fat would not pass the smaller vessels but blocked them mechanically. He described the pathological changes in the lungs, noted the presence of oil in the blood vessels, and alveoli, and described also the symptoms of dyspnœa, fever and râles.

Zenker in 1862 reported the first human case. This was a railway labourer who was crushed between two buffers and died shortly afterwards. At autopsy the pulmonary capillaries were seen to contain great numbers of emboli of fluid fat. In 1880 Scriba reviewed the literature, added cases of his own and conducted experiments to try and solve some of the problems. He reported the presence of fat in the urine and fat emboli in the lung, liver, kidney and brain. He stated that a subnormal temperature was usual and the occurrence of fever as evidence that fatty embolism was not the cause of death. Warthin, 1913, published the classical account of fat embolism. Vance, 1931, reported the occurrence of fat embolism in a large number of routine autopsies in New York. Scuderi, 1936, injected oil intravenously in dogs and took chest x-rays at intervals. He described the diffuse haziness and clouding of pulmonary fields. Warren, 1946, reviewed 100 consecutive fatal cases from the Army Institute of Pathology.

Pathogenesis.—After injury to fat of bone marrow or adipose tissue, fat is liberated by disintegration of the supporting fatty tissue. Pressure is increased in this vicinity by arteries pumping in blood while veins remain open to catch the fluid fat and transport it to the lung. Fat embolism is more common with fracture because the veins are encased in bony Haversian systems and can not collapse. It is also believed that lymphatic absorption occurs and this fat reaches the lung by way of the thoracic duct.

Several authors have doubted whether the above description of the mechanism is entirely correct. Animal experiments have led to calculations that it would need 210 grams of fat to kill the average man, and yet the adult human femur contains only 65 grams of fat. Another objection is that sometimes trivial accidents such as a fall from a height, jarring an amputation stump or manipulation of a joint have caused a fatal fat embolism. These authors suggest that substances are liberated that destroy the state of emulsion in which the normal fat exists in the blood plasma, and that this causes the fatal embolism.

Harmon (1949) suggests that lipases are liberated at the site of trauma and that injection of liquid paraffin fails to produce the picture of fat embolism. He also has shown that when fat is injected into animals the embolic phenomena are most prone to occur in the presence of dehydration, shock and anoxia.

Most authorities state that since 33% of people have a patent foramen ovale, fat can reach the brain by this route. It is interesting to note that in Warren's series of 100 fatal cases, only one patent foramen ovale was found. Warren believes that emboli are driven through the lung capillaries and thus reach the brain.

Clinical picture.—The clinical picture varies from cases so mild as to pass unnoticed to the rapidly fatal cases. The onset of fat embolism may be sudden but usually there is a period free from symptoms lasting from 3 to 72 hours. Following this either the picture of pulmonary embolism or cerebral embolism develops or they may be combined.

In the pulmonary type there is a rapid increase in the respiration rate. Cyanosis may develop. Due to passive congestion, moist râles are heard in both lung bases. A productive cough is a usual symptom and free fat may be found in the sputum. Later, pulmonary œdema may occur. The pulse is rapid. The

blood pressure is normal until the terminal stages when the heart fails.

In the cerebral type there may be drowsiness, disorientation, stupor leading to coma and death. Delirium is very common and tremors, convulsions, and paralyses may occur. The temperature is normal or raised depending on whether or not the heat regulating centre is affected. The skin may show petechiæ, usually across the chest.

Fat occurs in the urine and has been missed in the past. Two precautions must be taken in collecting a specimen for examination: (1) the catheter used must not be lubricated with fat; (2) all the urine must be obtained, as fat being lighter than urine rises to the top of the bladder.

The diagnosis is made by: the history of injury; the occurrence of pulmonary and/or cerebral symptoms; the presence of free fat in sputum and urine; the chest x-ray showing diffuse haziness and clouding of lung fields; the presence of fat emboli in the choroidal vessels as detected by the ophthalmoscope.

Pathology. — At post-mortem the following changes are noted: The lungs show areas of congestion, frothy fluid, small subpleural hæmorrhages. Many fat emboli can be stained in small arterioles and capillaries. Brain: pin point hæmorrhages in the white matter. Grey matter is unaffected. There is pericapillary hæmorrhage and necrosis in the white matter and fat emboli in the vessels. Kidneys: there are fat emboli in the glomeruli; the tubules are unaffected. Heart muscle: microscopically streaky hæmorrhages are seen. The capillaries contain fat. The liver and pancreas show fat emboli. Treatment is symptomatic, since there is no specific treatment for fat emboli. Preventive measures are important, such as careful handling of fractures with early immobilization, and the use of a tourniquet in orthopædic operations.

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128 Medical Arts Bldg.

RÉSUMÉ

L'auteur rapporte deux cas d'embolies graisseuses à la suite de fractures multiples, et citent les dernières théories pouvant expliquer cette complication. La pathogénèse en est encore très incertaine. Le diagnostic est fait par l'histoire du traumatisme, l'apparition de symptomes cérébraux et pulmonaires, la présence de graisse dans les crachats et les urines et dans les vaisseaux choroidaux. YVES PRÉVOST

THE ACUTE ABDOMEN*

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THE subject of the acute abdomen will always present an interesting challenge to the practitioner and surgeon alike. I have examined charts from the surgical services at the Cook County Hospital for a period of ten years, the purpose being to determine which diseases are most frequently mistaken in the acute abdomen. To my surprise I did not find 50 or 75 conditions which confuse us, but rather six outstanding ones that we mistake most frequently.

These six conditions are: (1) acute appendicitis; (2) acute cholecystitis; (3) perforated peptic ulcer; (4) acute hæmorrhagic pancreatitis; (5) renal colics; (6) coronary occlusion. There is a seventh disease which deserves special consideration, namely, salpingitis. Acute or chronic salpingeal disease is frequently associated with a perihepatitis which produces pain in the right upper quadrant (pseudo-gallbladder pain). Because of this, gallbladder explorations and other surgical procedures have been done in cases of salpingitis, resulting in danger to the patient and embarrassment to the surgeon.

To make a diagnosis one must have a simple and workable plan in mind. Our plan consists of four headings, namely: history, present symptom complex, physical examination and laboratory data. This routine has served us well and we utilize it daily.

ACUTE APPENDICITIS

The more one sees of acute appendicitis, the more one respects the condition. The statement "only an appendix" is indeed a dangerous one. This condition is most frequently found in individuals under the age of 40 and is somewhat more common in males. It will be recalled that gallbladder conditions appear most frequently after the age of 40. The story the patient relates is usually quite stereotyped. To put it in his language: "Something I ate gave me a belly-ache". This is his way of describing acute epigastric distress. When he gets his "belly-ache"

* Presented at the Counsellor District Number One Meeting of the Ontario Medical Association, St. Thomas, Ontario, on November 9, 1949.

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he often attempts to obtain relief with either a cathartic or an enema. Within the first 24 hours his "belly-ache" becomes a soreness low on the right side. His acute epigastric distress has become localized to the right lower quadrant. The "two-question test" is both useful and time-saving. Question No. 1: "Where was your pain when it started?" To this interrogation the patient points to his entire abdomen. Question No. 2: "Where does it hurt you now?" He then points to the right lower quadrant, usually McBurney's point. This simple method of having the patient demonstrate diffuse pain which localizes to the right lower quadrant will diagnose the vast majority of cases of acute appendicitis.

Nausea and vomiting have been impressed upon us as being associated with appendicitis. This is the exception and not the rule. Anorexia, or loss of appetite, is more constant and more important than either nausea or vomiting. Anorexia, nausea, and vomiting are three degrees of one symptom; anorexia is the mildest form and is associated with mild distension of the appendix; nausea the middle degree, is due to moderate distension; and vomiting, the maximum degree, is found in greatly distended appendices. The most common symptom in acute appendicitis is anorexia, and if the patient states that his appetite is not altered we doubt the diagnosis of an acute appendix. Two complaints which are extremely rare in acute appendicitis are diarrhœa and chills. These are probably found in less than 1% of the cases. Constipation is the rule.

Fever is not an early finding in acute appendicitis; in fact, if present, it is suggestive of peritoneal soiling. It is true that cases of acute appendicitis may have a fever of 102°, or 103°, but these are no longer cases of appendicitis; they are cases of far advanced peritonitis. Children prove the exception to this rule. If appendices could be operated upon when the temperature is below 99° the mortality would be very low.

Acute appendicitis does *not* give right rectus rigidity. Although the reverse is taught in many schools and textbooks, this point should be clarified. It is impossible for an individual to contract his right rectus muscle without contracting the left; therefore, when pressure is made upon an inflamed area, both rectus muscles contract. When only one rectus is rigid it suggests an underlying mass, such as a tumour or abscess. When both recti contract to pressure it should be considered "muscular defense" rather than right or left rectus rigidity. The importance of this bears emphasis when we realize that diagnosis, treatment and prognosis may depend upon the presence of right rectus rigidity or simple muscular defense.

The iliopsoas and obturator signs are not signs which diagnose acute appendicitis, but rather point to an acute appendix. Probably a misconception has arisen because these signs are usually discussed under the heading of acute appendicitis; they may, however, be produced in other diseases. The right iliopsoas sign is elicited by placing the patient on his left side and hyper-extending the right leg. If positive, pain is produced over the iliopsoas fascia which will be manifested in the region of the right lower quadrant. In the presence of a history of acute appendicitis this would signify that the inflamed appendix is overlying the iliopsoas fascia and is retrocæcal. A positive obturator sign will locate an inflamed pelvic appendix. It is conducted in the following way: with the patient on his back the thigh is flexed upon the abdomen and the leg upon the thigh; the leg is then abducted. This causes internal rotation of the thigh and stretches the obturator internus muscle. If this produces pain it is diagnostic of a fasciitis involving the obturator fascia, which could be caused by an inflamed tube, appendix, ovarian cyst, etc. If the patient gives a history of acute appendicitis with a positive obturator sign, we conclude that the appendix is low-lying and in the pelvis. Rovsing's sign is also helpful. It is elicited by pressing over the left side of the abdomen. The colonic gas which has been pushed to the right will produce pain over the cæcal region; this is quite diagnostic of acute appendicitis.

Routine bi-digital examinations are done; at times an acute appendix or appendiceal mass may be felt. Late and neglected appendices may produce a pelvic abscess which points rectally or vaginally, and this examination reveals the proper site and time for incision and drainage.

The laboratory data usually consist of a white blood count and a urinalysis. More important than these is a differential blood count; this is easy to do and is more accurate. If the polymorphonuclear count is high, we assume

that an acute infectious process is present; a high polymorphonuclear count in the presence of a low white count means a poor prognosis. The urinalysis is usually negative but may be misleading; a few red cells in the urine are not pathognomonic of renal disease. Negative urines have been recorded where a renal stone completely blocks the ureter so that no blood or pus can pass into the bladder.

ACUTE CHOLECYSTITIS

The dictum that certain types of people are predisposed to certain types of diseases seems to be correct. The gallbladder type is described as fair, fat and forty, usually being a female in the latter third or fourth decade and somewhat obese. There is always an exception to the rule, hence, the most fulminating hydrops of the gallbladder on our service was seen in a young, thin boy of 16. The age of 40 is related to a previous history of pregnancy, and this is theoretically explained in the following way: the average female has her children in the second decade of life and while pregnant she develops a physiologic hypercholesterolæmia. Some of this cholesterol forms on the mucous membrane of the gallbladder and forms polypi which break off and become the nuclei for stones. It may take from 10 to 20 years for gallstones to attain any appreciable size, so that by the time she reaches her fourth decade the stone is large enough to obstruct or irritate. Nulliparous women can also have gallstones or gallbladder disease, but this too, is the exception and not the rule.

The history of recurrent attacks of abdominal pain in a middle-aged female, so severe that the physician must administer a sedative, should suggest an acute gallbladder until proved otherwise. Acute appendicitis does not require morphine; renal colics will be differentiated presently, and coronary occlusion is less common in the female. One of the most unusual lesions noted in the female is a perforated peptic ulcer. The gallbladder patient also presents a previous history of "selective dyspepsia". By this we mean that there are certain specific foods that she cannot tolerate. There are four primary offenders, namely, fried and fatty foods, raw apples, cucumbers and cabbage. The patient does not use the term "dyspepsia", but describes this distress as the two "B's": namely, bloating and belching. To summarize, one may use an alliteration and state that the gallbladder patient is one with the seven "F's": she is the Fair, Fat, Fertile, Flatulent, Flabby, Female of Forty.

PAIN

The complaint is one of pain, and it is important to determine the type of pain which is present. A constant pain is due to œdema, but colicky pain is caused by obstruction. This is one of the factors which indicate whether the case should be treated conservatively or surgically. It is unwise to treat an obstructed lesion conservatively since these are cases which result in early gangrene and perforation. Morphine should not be used in gallbladder disease because it is a smooth muscle contractor, and since the gallbladder is a smooth muscle organ one should not administer a medicament which would stimulate its activity. By increasing muscle tonus, morphine may actually aggravate or provoke gallbladder pain and colic. One should not state, however, that the drug must never be used in gallbladder disease since it still has its place, namely, to prevent shock. These patients are treated first with nitrite therapy. One breaks an amyl nitrite bead and lets the patient inhale the vapour; 1/100th grain of nitroglycerin is placed under the tongue, and 3 grains of sodium amytal or any other barbiturate is given by mouth. If this gives no relief we administer a hypodermic which consists of 100 mgm. of demerol and 1/100th of a grain of nitroglycerin. Should these measures fail, antispasmodic therapy with such drugs as papaverine, aminophylline, etc., is tried. Morphine is used only after all other measures have failed.

Gallbladder pain usually is located under the right costal margin, but may be referred to the stomach since these two organs originate from the same embryologic segment. The stomach responds to this stimulus in one of three types of gastric spasms: (1) pylorospasm; (2) midgastric spasm, and (3) cardiospasm. If a pylorospasm is produced the gallbladder condition might be confused with peptic ulcer; if midgastric spasm results, a stomach carcinoma may be diagnosed erroneously; and if associated with cardiospasm, the pain appears on the left (pseudo-coronary pain) and coronary disease may incorrectly project itself into the diagnostic picture.

Referred pain should not be confused with radiation of pain. By radiation we mean that

gallbladder pain, located under the right costal margin, may radiate along the path of the seventh intercostal nerve to the inferior angle of the right scapula, or the interscapular region. Gallbladder pain, therefore, cannot radiate to the right shoulder. Shoulder pain is an entirely different mechanism which involves the phrenic nerve and is indicative of peritonitis. When a gallbladder patient has true shoulder pain a diagnosis of gangrenous or ruptured gallbladder with biliary peritonitis should be made.

Temperature, pulse and respirations are included under the heading of physical examination. The patient with an acute gallbladder has an early high fever, hence, a temperature of 102° is not unusual within the first 12 to 24 hours of acute cholecystitis. The early fever is explained by the absence of a submucosa. Since this tough resisting layer is lacking, there is greater chance for early contamination and absorption in the peritoneal cavity. The patient has a pulse which is increased according to the temperature, therefore, for every degree rise in fever there will be approximately a 10 beat increase in pulse rate. Respirations are slightly increased because breathing is painful. This is due to the fact that the inflamed gallbladder rubs against the sensitive parietal peritoneum; because of this, acute gallbladder disease may be confused with pneumonia or pleurisy.

Although pain, a symptom, may be referred anywhere along its nervous pathway, tenderness, a physical finding, remains at the site of disease. This is an excellent diagnostic rule, having few if any exceptions. The tenderness of gallbladder disease will be located in the region of the right costal margin. If it is most marked on a level with the umbilicus, it may be difficult to determine whether the condition is an inflamed, low-lying gallbladder or an acute high-lying retrocæcal appendix. Two ways aid in the differentiation of these two conditions. First, we recall that the normal abdomen reveals a tympanitic note to percussion in all four quadrants. If the tenderness opposite the umbilicus is due to an inflamed gallbladder, we assume that the organ is unusually large or that a ptotic liver with an inflamed gallbladder at its free border is present. This would cause an obliteration of the normal tympany in the right upper quadrant and in its place the percussion note would be one of fullness or flatness. If the patient presents tenderness on the level with the umbilicus and retains normal tympany in the right upper quadrant, this would point to a high-lying retrocæcal appendix. Another method of differentiating the gallbladder and appendix is by means of Ligat's test. This test locates areas of hyperæsthesia over an inflamed organ. If the tenderness is due to gallbladder disease, an area of hyperæsthesia (elicited by picking up the skin and letting it drop) is present from the umbilicus upward to the right costal margin. If the tenderness is due to an acute appendix, the area of hyperæsthesia will be found from the umbilicus down to Poupart's ligament.

A rectal examination is done as a routine in every physical examination. More important than the rectal or vaginal examination is a so-called bi-digital, which is conducted by placing the index finger in the vagina and the middle finger in the rectum with the perineum in between. This will immediately orient the examiner and adnexal disease will be revealed.

A flat x-ray film should be taken in every acute abdominal condition. One may determine whether a calcified gallbladder or visible stones are present. It also gives an indication as to whether or not the liver is enlarged or ptotic. Routine laboratory tests are done.

PERFORATED PEPTIC ULCER

This condition is rare in females. Usually a previous history of peptic ulcer or hæmorrhage can be obtained, but the onset may be with perforation.

The patient states that he was seized with a sudden pain, usually after eating; this was so severe that it doubled him up. The classical picture of perforated peptic ulcer with board-like rigidity and a shock-like syndrome is too well known to bear repetition. Two signs which should be sought for in every case, however, are: (1) the findings with auscultation and (2) the presence of a pneumoperitoneum. Auscultation reveals an absolutely silent abdomen when an ulcer perforates, leaks and soils the peritoneal cavity. This is not a new observation, since the late J. B. Murphy stressed the importance of this finding many decades ago. When intestinal sounds are present, the diagnosis of perforated peptic ulcer is remote. There are exceptions, and one of these will be discussed presently under the subject of forme fruste ulcer. The next sign which helps clinch the diagnosis is the

demonstration of a spontaneous pneumoperitoneum. Normally a magenblase or stomach air bubble is present. When an ulcer perforates, this air bubble escapes into the general peritoneal cavity, and can be demonstrated either by percussion or with the fluoroscope; the latter is by far the more accurate. The patient is placed on his left side so that the free air bubble may gravitate upward between the liver and the right hemidiaphragm. By so doing, the liver is displaced downward and is separated from the diaphragm. Normally, the liver hugs the diaphragm and no air space is visible between them. If this air is of an appreciable amount, normal liver dullness is obliterated and in its place a tympanitic note is produced by percussion. The sign is easy to demonstrate, quite pathognomonic of perforated peptic ulcer, and present in about 70% of all cases.

The forme fruste ulcer deserves special mention. The term refers to a pin-point perforation in the stomach or duodenum which is immediately sealed over by muscular contraction or by the overlying liver. Therefore, the spillage is minimal and the amount of peritoneal soiling is small. Such patients may experience a sudden sharp pain in the epigastrium, but the typical physical findings are lacking. This patient may be able to straighten up and walk about. Abdominal sounds are usually present and the air bubble may remain intragastric, having had no chance to leave the small perforation. These patients, therefore, present a misleading picture and have been misdiagnosed. However, with the ingestion of their next meal they usually reperforate and then present the typical findings.

The temperature, pulse and respirations will depend upon whether shock is present. Most perforated peptic ulcers present a shock-like picture which varies in its intensity. The shock associated with perforated ulcer responds rapidly to therapy. Within a few hours, the classical picture of peritonitis develops with the associated increase in temperature, pulse and respiratory rate.

The contents from a perforated ulcer may pass downward along the so-called "paracolic gutter of Moynihan", pool around the appendix and produce exquisite tenderness at McBurney's point. The diagnostician must then be on his guard, since such a history would suggest an epigastric distress with localization to the right lower quadrant which could be confused with an acute appendix. Upon exploratory operation, free fluid will be found in the peritoneal cavity with all the signs of a peritonitis, and a red and injected appendix seen and removed. These patients usually die if the leaking ulcer is overlooked. This catastrophe can be avoided if, before closing the abdomen, the appendix is opened and the mucous membrane examined. Since acute appendicitis starts in the lumen of the appendix and travels outward, a normal looking mucous membrane would suggest looking elsewhere for the cause of the peritonitis.

Laboratory data include the flat x-ray film which has been discussed under the subject of spontaneous pneumoperitoneum. Routine blood count and urinalysis are done. Some of these patients might have bled, and although perforated ulcers are known not to produce massive hæmorrhage, signs of a secondary anæmia may be present.

Acute Hæmorrhagic Pancreatitis

It is important to recall that this disease may appear in one of two forms: either acute œdematous pancreatitis or hæmorrhagic par creatitis. The former presents a mild clinical picture, but the latter which is associated with fat necrosis and occasionally a hæmorrhagic peritonitis produces a fulminating one. The acute œdematous form usually improves rapidly without therapy within 48 hours, but hæmorrhagic pancreatitis gets progressively worse and often requires surgical intervention. It is the hæmorrhagic type, therefore, which is important to identify and treat promptly.

Although the etiology of pancreatitis is unknown, there seems to be a mechanical factor which is associated with spasm, stones, swelling and stasis. Recent work seems to emphasize the relationship between acute pancreatitis and acute cholecystitis. This seems to be due to a common factor which is an obstruction distal to the junction of the pancreatic and common bile ducts converting them into a "common channel". An actual reflux of pancreatic juice into the gall bladder during an attack of acute pancreatitis has been shown. The patient who develops acute pancreatitis is usually of the same type that develops gallbladder disease, therefore, the condition is more common in females, rarely occurring before the age of 40, and is seen in stout people. The ratio of

coloured to white is 1 to 50. The attack usually follows the ingestion of a heavy meal. The pain is dramatic, sudden and excruciating; it is felt in the epigastrium, and radiates into one or both loins. In this way pancreatic pain radiation resembles an inverted fan. When the patient sits up or lies on his abdomen, the pain is relieved, and is aggravated when he is on his back. Hence, in most pancreatic conditions, be they tumours or inflammations, the patient is usually found lying on his abdomen or in a sitting position. Reflex vomiting or retching almost always occurs; emesis which is truly reflex in nature is never fæculent.

Physical examination reveals a patient who is usually in shock with cold and clammy extremities, subnormal temperature, and a rapid, thready pulse. Local epigastric tenderness is almost always present and is associated with a type of muscular defense which is localized to the same area. The rigidity is not truly board-like in nature, and the tenderness is most marked midway between the umbilicus and the xiphoid. An occasional finding is ecchymosis in one or both loins, or at times around the umbilicus. This is due to extravasated blood which finds its way around the retroperitoneal space and presents itself as greenish yellow or purplish discolorations. This finding, however, takes two or three days to appear. Mild jaundice is present in about half of the cases; this is explained by the fact that the common duct is pressed upon by a swollen head of the pancreas. Abdominal auscultation usually reveals a quiet but not silent abdomen.

Laboratory findings may be helpful in the diagnosis. An increase of serum amylase is specific in the acute phase, although a normal reading does not rule out acute pancreatitis. Polowe has emphasized the importance of determining the blood amylase activity in terms of cuprous oxide precipitation. He has shown that moderate to marked blood amylase activity is almost always associated with disease of the pancreas, and normal or decreased blood amylase almost always excludes pancreatitis. Hypocalcæmia is usually present and the level found is usually below 9. A flat x-ray film of the abdomen may reveal a separation of the upper and lower limbs of the duodenum brought about by an œdema of the head of the pancreas. This latter finding is unusual.

RENAL COLIC

Stones are not the only substances which produce renal colic, since the same syndrome may be produced by a small blood clot, inspissated pus, uratic debris, or a kinking of the ureteropelvic junction in a ptotic kidney. The condition is more common in males, and the patient may reveal a history of previous attacks, a hereditary influence, a story of gout, or parathyroid disease.

The patient complains of a sudden pain which starts in the lumbar region and radiates to the testicle, vulva or the inner aspect of the thigh. With this pain he becomes extremely restless and thrashes about. A patient who is experiencing a colic is restless and moves about, but one who has a peritonitis lies perfectly quiet and resents being moved. Vomiting is a common symptom, as is frequency or urination. During the act of micturition the pain may be altered.

Physical examination rarely reveals any elevation in temperature, but extremely characteristic of the condition is a bradycardia. It has ofttimes been stated that when a patient with an acute abdomen has "a clean tongue and a slow pulse" he has a renal colic until proved otherwise. Tenderness is not marked in the region of the twelfth rib of the involved side, and to elicit this finding it is unnecessary and cruel to utilize any type of "punch" test. The tenderness is so exquisite that mild palpation will demonstrate it. We prefer to use the term "Murphy tap" to "Murphy punch". A zone of hyperæsthesia is usually found posteriorly at the level of and slightly below the twelfth rib. If this area is anæsthetized with novocaine, the hyperæsthesia and pain disappear.

A flat x-ray film may reveal a stone if such is present, but this is not reliable since non-opaque substances may also produce kidney colic. An intravenous pyelogram can be made without disturbing the patient, and if necessary, the films can be taken at the bedside with the aid of a stationary grid. The significant finding for a diagnosis of a stone in the ureter is the anuria which may be present on the affected side; the opposite side shows normal excretion. The kidney on the affected side usually appears increased in density since the dye in these tubules is more concentrated. This finding is sufficient for diagnosis of non-opaque stones in the ureter. A catheter specimen of urine usually reveals pus, blood and albumin. The presence

or absence of pus and blood in the urine is not pathognomonic since a stone may completely block the ureter and result in a normal urine. On the other hand, an inflamed appendix may be attached to the ureter, kidney or bladder, resulting in a secondary ureteritis, nephritis or cystitis with an associated hæmaturia. In such instances the laboratory report may actually be misleading.

CORONARY OCCLUSION

Although this belongs to the realm of the internist, the general practitioner as well as the surgeon must be on his guard to avoid the fatal error of confusing an acute coronary disease with an acute abdominal condition.

Men are most susceptible to this condition, and it is usually found in those past the age of 40. A previous history of dyspnœa or pain in the chest during exertion or excitement may be elicited. The attack is sudden, with severe pain in the chest which radiates out the left arm towards the abdomen or both shoulders. There is a sense of impending death with severe fright which usually supersedes the complaint of pain. The radiation may also be toward the epigastrium, so that the examiner's attention is directed to the abdomen rather than the chest. A usual complaint during such an attack is one of "indigestion". Although the pain of acute coronary disease may occur in the abdomen, it does not become localized; hence, no area of local abdominal tenderness is ever found. Marked abdominal distension may be present in coronary disease, but muscle defense or rectus rigidity are lacking. In abdominal catastrophes the patient lies perfectly quiet, but the coronary patient resembles the colic in that he is restless and tosses about. The acute cardiac patient presents veins in the neck which are distended and full, in contrast to the patient with the surgical abdomen who may appear pale and bloodless. Signs of impaired circulation are usually present, such as dyspnœa, orthopnœa, and cyanosis. Auscultation will usually reveal râles in both bases due to pulmonary congestion. Cardiac enlargement, feeble heart sounds and occasionally a pericardial friction rub may be found. During auscultation of the abdomen, normal intestinal sounds will be heard which are absent or diminished in cases of peritonitis.

Positive electrocardiographic findings are pathognomonic, but one is not always fortunate enough to have an electrocardiogram handy. A leukocytosis may be present some hours after the disease takes place, and the urine is usually negative unless there is associated renal disease.

We realize that many other conditions at times require differentiation in the acute abdomen, among them strangulated herniæ, regional ileitis, mesenteric lymphadenitis, mesenteric thrombosis, ruptured ectopic pregnancy, ruptured Graafian follicle, ileocæcal tuberculosis, vasitis, torsion of the omentum, volvulus, intussusception, etc., *ad infinitum*. However, when one misses one of the unusual conditions he does not feel quite as responsible or guilty as he would having missed one of the forementioned "big six".

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CARCINOMA OF THE PROSTATE*

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THE incidence of carcinoma of the prostate is so high in men over fifty that further consideration of the problem merits our attention. The epochal work of Huggins, published in 1941, has stimulated research both as to the cause of carcinoma of the prostate itself, and also of cancer in general. Arising from his work is a concept of therapy which has changed the picture in these cases from one of utter gloom to a somewhat brighter outlook. As we remember their former fate—opiates for pain and permanent suprapubic drainage for relief of urinary obstruction — it is indeed a satisfaction to have a simple method of treatment to offer which may give relief for years.

INCIDENCE

The seriousness of the situation is emphasized as we remember the incidence of prostatic carcinoma. The late Dr. Hugh Young wrote: "My studies indicate that carcinoma was present in about 21% of the patients who came to me with prostatic obstruction". But even more frightening are the results of the studies

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of Rich and Moore published in 1935. Rich calls attention to the frequency of occult cancer. He found carcinoma of the prostate in 14% of a series of 292 consecutive autopsies on males over 50 years of age dying from various causes, and in 28% of males between the age of 71 and 75. In 66% of these cases the tumour was not recognizable clinically, having been too small in most cases to have produced symptoms or to have attracted attention on examination. The carcinomatous areas were most often near the outer margins of the gland and even when only a few millimetres in size, showed a tendency to invade the capsule. Moore found carcinoma in 16.7% of 675 autopsy studies. No case was observed in an individual below the 44th year and the age incidence steadily advances until 29% of autopsy cases in the ninth decade show the lesion. Statistics show that 4% of all cancer deaths in the male result from carcinoma of the prostate —and in every 1,000 deaths in the male six are due to cancer in this organ. We know that life expectancy is increasing—that the number of men living beyond the age of 65 years of age has doubled between 1911 and 1935. Thus proportionately the number of cases of carcinoma of the prostate is also increasing.

ETIOLOGY

An entirely new concept as to the etiology of cancer in general—and of prostatic cancer in particular—has been evolved since Huggins, in 1941, showed without a shadow of a doubt the relationship between the activity of this type of cancer and the androgenic substances elaborated in the body. C. P. Rhoads, in his Ramon Guiteras lecture delivered before the American Urological Association in 1948, presented very lucidly the present trend of thought with regard to the relationship between the endocrine system and cancer. He believes that cancer in man is due to a systemic disturbance related to compounds formed by the endocrine system. These compounds seem morphologically related to the steroids in tar which we know are also productive of cancer. His group found in patients with cancer that there is adequate evidence indicating disturbed manufacture of steroid hormones and that this disturbance of hormone manufacture is present before cancer is obvious. This is, in short, the chemical theory—that through an error of hormone manufacture in the body, compounds capable of causing neoplastic change are produced. Huggins had shown that testosterone given to patients with prostatic cancer produced a definite exacerbation of the disease, marked not only by symptomatic evidence but also by increased levels of acid phosphatase in the serum. He showed also that removal of the supposed source of testosterone, the testes, resulted in profound amelioration of the symptoms of prostatic cancer. With these known facts as a basis, Rhoads and his workers began the search for some compound of a structure like that of testosterone, but perhaps somewhat different and more allied to a tar carcinogen in its molecular configuration. The urine of normal individuals and those having definite carcinoma of the prostate was studied. In these urines, five pure compounds of steroidal nature were identified and the amount excreted in twenty-four hours was measured. Two of these steroids were known to result from the breakdown of testosterone, whereas the other three were of slightly more complex nature and were not derived from the gonads but from the adrenal cortex. Two were always present in normal urine, the third was not. However, in cases of carcinoma of the prostate there was a great decrease in the steroids normally arising from gonadal function with an increase in the two steroids normally arising as the result of adrenal cortex activity and the production in significant amounts of the third steroid not seen in normal urine. The conclusion drawn was that the presence of this compound is significant, but is not fully specific of cancer.

From the facts already known it can be readily seen that a new field of experimentation has been opened which may ultimately lead to the full discovery of the cause of cancer.

PATHOLOGY

Young's description of the pathology is still considered the most complete and concise. I quote from Boyd's *Surgical Pathology*:

"We feel convinced that carcinoma of the prostate does not result as a degeneration of a previously benign adenomatous process; that in about half of the cases it develops where no hypertrophy is present; that in such cases the prostate is little if at all enlarged; that the carcinomatous growth follows planes of least resistance; that it is very slow in invading fibrous capsules both of the prostate itself and also of the hypertrophied lobes; that the mucosa and submucosa of both urethra and bladder are also very resistant to it; that the most common site for the beginning of cancer is in the posterior subcapsular stratum or lobe, and that from

there it may invade the rest of the prostatic glandular tissue, or it may travel upward, escaping from the upper end of the prostate in the region about the ejaculatory ducts, and between the fascia of Denonvilliers posteriorly and the trigone anteriorly; that in its further growth the seminal vesicles and vasadeferentia may not become infiltrated, but in some cases their lumina may become filled with cancer cells and, in the case of the vasa deferentia, these may extend upward for a long distance, the outward walls of the vas remaining apparently intact; that the muscle of the trigone and bladder and also the peritoneum may be invaded from this subtrigonal involvement; and finally, that the fascia of Denonvilliers, which gives the prostate its most dense capsule posteriorly, is a most effective agent in preventing involvement of the rectum and periprostatic structures.''

The chief characteristic of the growth is the consistency, which is extremely hard and dense. When cut into it imparts a gritty sensation to the knife and the surface is dense, dry, without lobulation and small yellowish islands composed of carcinomatous cells are seen separated by the more translucent fibrous tissue. Microscopically the appearance may vary but two types of growth are encountered, the scirrhous and the adenocarcinomatous. The former is much more frequent, presenting strands and columns of darkly staining cells infiltrating the growth and separated by a dense fibrous stroma. In the adenocarcinomatous variety irregular acini of large cells are scattered here and there, the intervening stroma being infiltrated with wandering epithelial cells.

The mode of spread is of great surgical importance and from this point of view two main types of tumour may be recognized. The first takes the form of a small local lesion with a marked tendency to the formation of widespread and early metastases. In the second there is a massive local lesion but spread occurs at a later date. Spread to distant sites may occur through the lymph stream or the blood stream. The pelvic and lumbar lymph nodes are involved early in the disease. Lymphatic spread, either by permeation, or embolus, may then involve the thoracic and supraclavicular nodes and such organs as the liver, lungs and pleura may become the seat of secondary growths.

There is an abundant nerve supply in and around the prostate and these nerves are accompanied by lymphatics. Lymphatic permeation as well as lymphatic embolism is common by this route, which seems to explain the very frequent involvement of the bony pelvis and lumbar spine. Pain is an indication of perineural involvement. Skeletal metastases, which occur in so many cases, must be attributed to blood infection. Batson considers the spread is probably by the vertebral veins. He injected radio opaque material into the dorsal vein of the penis in cadavers and reproduced the typical spread of metastases as seen in prostatic carcinoma. The vertebra, pelvis and ribs are most often involved, although no bone in the body may escape in widespread cases. Radiologically, these bone metastases are peculiarly dense and sclerotic.

An enzyme capable of hydrolyzing phosphoric esters with maximum activity at pH 4.8 was found to be present in large amounts in the human prostate by Kutscher and Wolbergs, in 1935. This acid phosphatase was also found to be in even greater concentration in carcinoma of the prostate by E. B. Gutman and A. B. Gutman and their associates, and they also found that the blood serum of certain patients with disseminated prostatic carcinoma exhibited increased phosphatase activity. Robinson, Gutman and Gutman in 1939, concluded after considerable study that a marked rise in acid phosphatase in blood serum is associated with the appearance, or spread, of radiologically demonstrable skeletal metastases and implies dissemination of the primary tumour and thus is of unfavourable prognostic significance.

Huggins, in his work, came to the conclusion that carcinoma of the prostate with skeletal metastases is sometimes present with serum acid phosphatase within the normal range but that when there was a marked rise of acid phosphatase above 10 units disseminated prostatic carcinoma was always present. The blood serum of normal adult humans contains 4 King and Armstrong units, more or less, per 100 c.c. of blood. Any elevation is suspicious.

SYMPTOMATOLOGY

From what I have already stated, it is obvious that early carcinoma of the prostate is symptomless. The first symptoms are most often prostatic obstruction. Usually these first symptoms are ignored by the patient as the usual thing in a man of his age and it is often years before advice is sought. Frequency and difficulty of urination in the mind of the laity is not suggestive of a malignant condition and so no fears are aroused. And it is very true that probably the majority of cases who have progressed to the state of having any obstruc-

tive symptoms have extension of the growth beyond the capsule of the gland.

Acute retention is a common complaint and in a small percentage of cases is the first symptom. Pain referred to the sacroiliac region, perineum, rectum, inguinal regions, or thighs is a prominent but late symptom in about 5% of the cases and is due to perineural lymphatic involvement, or metastases to the bones. Sciatica in a man over fifty years of age is always a suspicious symptom and carcinoma of the prostate should be excluded. Similarly, anæmia, loss of weight, loss of strength, hæmaturia, urinary incontinence, œdema of the legs, constipation, etc., are of late onset and do not help in making an early diagnosis.

DIAGNOSIS

The first and main point in diagnosis of carcinoma of the prostate is the palpation of the prostate gland rectally. This should be routinely performed on all men over 45 years of age at regular intervals if we ever hope to diagnose these cases sufficiently early in order to be able to offer them any more than palliative treatment. Any extremely hard nodule in the posterior lobe, even if very small, should be viewed with suspicion. As the condition becomes more advanced, nodulation, induration, stony hardness, irregularity of contour and extension to the other tissues are found. Careful palpation of the seminal vesicles and the tissues between them give a clue as to the degree of extension. Cystoscopy and cystourethroscopy is not diagnostic but rigidity of the vesical neck is a very constant finding in these cases.

Biopsy of the growth with pathological examination is diagnostic if the section is taken from the involved area but it is understandable that it may be missed in early cases where the growth is of small size and confined to the posterior lobe. In cases seen early where possibility of radical surgery is feasible a perineal exploration should be done. A frozen section of the suspicious area is taken and if it proves to be malignant the remainder of the operation can be performed immediately. In all other cases I believe transurethral resection is the method of choice, in fact I would go so far as to say that it is the only justifiable method at present at our disposal. It is possible to take sections accurately from any area in the prostate if one directs his diathermy loop with his finger in the rectum. One may only take sufficient for biopsy if the patient is not having obstructive symptoms, or may do a complete resection at the same time if obstructive symptoms indicate treatment is also needed. The appearance of the section of gland obtained is usually quite characteristic. The shavings of prostatic tissue are fuzzy, yellowish, firm and the cut surface usually bleeds very little.

X-rays of the bony pelvis and lumbar spine are always indicated, especially if pain is a symptom. It will show if there are any demonstrable bony secondaries and will also show prostatic calculi. However, it is possible to have malignancy and prostatic calculi in the same gland. Estimation of serum acid phosphatase, if elevated, is diagnostic of bony metastases, but one should remember a normal value should not influence one in his diagnosis, particularly if it is contrary to clinical judgment.

Differential diagnosis must be made between carcinoma, tuberculosis of the prostate, prostatic calculi, infarcted prostate and localized areas of chronic prostatitis. The degree of induration is often the clue but at times biopsy is the only method by which a definite diagnosis can be made.

TREATMENT

Castration and, or, œstrogenic therapy combined with transurethral resection is the operation of choice for relief of obstructive symptoms, prolongation of life and relief of pain in the majority of cases. Early radical perineal prostatectomy offers a hope of cure in a small percentage of patients seen. Deep x-ray therapy, implantation of radon seeds, permanent suprapubic drainage, radiation of the pituitary and adrenal glands and adrenalectomy have all been advocated but for the most part are now discarded.

DISCUSSION

In the period from July, 1942, when we first began to treat our cases of carcinoma of the prostate by orchidectomy and transurethral resection, until December, 1947, a total number of 903 cases of prostatism were admitted to the Urological service of the Kingston General Hospital. Of these cases 145 were proved carcinomatous. This means that 16% of all our cases of prostatism were malignant. For the purpose of evaluation of the effects of therapy I have

reviewed all the cases treated between July 1, 1942, and December 31, 1945. In all 64 cases of carcinoma of the prostate were treated during this period. All these cases were referred to hospital because of symptoms of urinary obstruction. A preoperative clinical diagnosis of carcinoma of the prostate was made on rectal examination in 59 cases, or 92%. The remaining cases proved malignant on routine pathological examination. It is interesting on examining the records to find two cases in whom a diagnosis of carcinoma of the prostate was made clinically, which was not proved on pathological examination, but both these cases died later of widespread metastases. Three other cases had had a suprapubic prostatectomy some years before and returned later with vesical neck obstruction which proved to be due to malignancy of the prostate.

In this series of 64 cases I have been able to do a follow up on 61. Two cases, or 3.3%, showed no improvement and died without leaving hospital. The remainder all showed improvement for a shorter or longer period of time. Forty-four cases, or 72%, had died at the time of the end of this survey in May, 1949. The average number of months they survived was 28.6. I was unable to ascertain the cause of death in every one of these cases so cannot state how many died as a result of their malignancy. There are still living from this series 15 cases or 24.6%. Of these 6 cases are showing definite signs of progression of the disease with obvious active metastases. The remainder are apparently enjoying reasonably good health. The longest survival period in this series was 79 months from time of first treatment.

These figures do not give a true picture of the really miraculous results obtained at times from the use of hormone therapy. A recent case which I will briefly describe illustrates my point very graphically.

G.S., aged 71 years, was admitted to the Urological service May 10, 1949, with the following complaints: (1) Frequency, dysuria, poor urinary stream with delay on starting and terminal dribbling, for 8 months. (2) Severe pain and stiffness in left hip region for 7 months, so severe that he had been confined to bed for 2 months. (3) Nausea, vomiting, abdominal distension with colicky abdominal pain, complete constipation with no passage of either flatus or fæces for three days. (4) Loss of 42 lb. in the past six months.

Examination revealed a cachectic, emaciated male with dry, furred tongue and fœtid breath. His abdomen was distended, tender and tympanitic with visible peristalsis. Any movement of his left leg was bitterly resented. Rectally his prostate was nodular, stony, hard, and fixed. Radiologically he had extensive bony metastases of his pelvis, and head and greater trochanter of left femur. His bladder contained only 2 oz. of urine, which showed much pus. Flat plate of his abdomen showed the typical ladder pattern of small bowel obstruction. His blood urea was 77 mgm. %.

Treatment consisted of urethral catheter drainage of bladder—Wangensteen drainage of stomach—adequate I.V. therapy and 15 mgm. of stilbœstrol intramuscularly daily. By May 15, five days later, he was passing flatus, so both urethral catheter and stomach tubes were removed. He asked to be allowed out of bed and found that he could now walk with very little discomfort. From then on there was constant improvement, although he had several episodes of vomiting.

On June 3, a bilateral orchidectomy was performed. Following this, he stated, he began to pick up strength even more rapidly than before. He was discharged June 9—just one month after admission—now completely relieved of his admission complaints.

Alyea[15] asked these questions about hormone treatment: (1) How long will this relief last? (2) Will the patients live longer and more comfortably? (3) Will early orchidectomy prevent or retard metastases? (4) Which is the best order of therapy, stilbœstrol then orchidectomy, or both together?

Speaking generally we can say that orchidectomy certainly promises the patient a much more comfortable, happier and longer life than other types of treatment. More men are living more comfortably than ever before with œstrogen therapy.

Huggins, reporting in 1946 the five year results following orchidectomy, analyzed 27 consecutive cases, all far-advanced with bony metastases or local infiltration beyond the capsule. In 10% of cases there was no obvious benefit from castration. Fifteen were dead with an average survival period of 16 months and with an average period of improvement of 11 months. Five patients survived more than five years after castration with no sign of disease detectable in four of them. His conclusion is that, although the effects of orchidectomy in prostatic cancer are at times very profound and prolonged, it is premature to suggest that any one of these patients has been cured.

Green and Emmett, of the Mayo Clinic, in reviewing their cases in 1945, state that metastatic pain was relieved in 60% of patients but recurred in 30% of these cases in four to fifteen months. Deming states that 80% of patients with prostatic cancer responded to hormonal therapy while about 20% of human prostatic cancer cases fail to respond to castration or œstrogen therapy. Stirling in analyzing 40 cases of carcinoma of the prostate treated with castration and œstrogen therapy states that

this method of treatment seems to be palliative and that neither modality prevents recurrence or retards metastases. Both Nesbitt and Cummings, of Ann Arbor, and Emmett, of the Mayo Clinic, report series of cases that developed metastases following orchidectomy.

The adult prostatic epithelium which is the offending cell of carcinoma is partially under the control of the androgenic hormone. If this hormone was secreted only by the testis, castration should completely prevent further activation of this epithelium. However, we know there is an extra-gonadal androgenic source—most likely the adrenals. With the removal of the inhibiting action of the testis on the anterior lobe of the pituitary this lobe becomes over-active which, in turn, stimulates the adrenal cortex to produce androgenic hormones; thus we are faced after orchidectomy with the problem of inactivating the extra-gonadal hormone. Alyea considers, therefore, that orchidectomy should be carried out as soon as the diagnosis of carcinoma of the prostate is made provided the patient is not a candidate for the radical operation. Then the extra-gonadal androgenic hormone should be inactivated by stilbœstrol; this should be started immediately after operation. Deming, in his work on heterologous growth of human prostatic cancer, summarizes his impressions thus: prostatic cancer clinically and heterologically after varying periods of growth becomes tolerant of œstrogen which suggests that the greatest effect from its use may be expected by greater hormonal unbalance applied early in the disease. Hormonal treatment should be given as early as possible in inoperable prostatic cases in order to gain the most decisive action of hormones; the hormones should be given (*a*) early; (*b*) hormonal bombardment—that is castration and large doses of œstrogen.

Huggins writes; the question of supplementary therapy arises in patients with unfavourable response to orchidectomy. It can easily be demonstrated that the addition of œstrogen to a small number of patients in relapse will cause improvement. Two factors are apparently of significance in determining the effectiveness of orchidectomy. The tumour must be androgen-dependent and the testis must contribute functionally significant amounts of the total production of androgen. He reserves the use of stilbœstrol to those cases which show relapse.

Recent literature shows a definite swing of the pendulum away from the thought that œstrogen therapy, as practised at present, is the whole answer to the question of carcinoma of the prostate. More and more reports are appearing of the five and ten year results following radical surgery and certainly they seem to indicate a reasonable hope of cure in early cases. The number of cases suitable for radical perineal prostatectomy varies greatly in the series presented by different authorities. Many consider that having made the diagnosis of carcinoma of the prostate it is technically impossible to do any type of surgical procedure which would effect a cure. As compared with this Dr. Robert Gutierrez, of New York, states: "In the past only 10% of cases were operable and thus amenable to surgical cure, while now, following the administration of hormone therapy, or castration—inoperable cases can be rendered operable in about 80% of cases."

The answer probably lies somewhere between these two extremes.

CONCLUSION

We have discussed the incidence, known etiological factors, diagnosis, treatment, and the end results of the present trend in the treatment of carcinoma of the prostate. If diagnosed early before there is extension through the capsule, radical perineal prostatectomy offers a reasonable hope of cure. There is a possibility that castration and œstrogens, by shrinking the involved gland, may increase the number of cases considered operable. The remainder of cases will be much benefited by œstrogenic therapy. Life will be prolonged and made more comfortable.

More detailed work is necessary before we can offer an adequate program of control for prostatic carcinoma. Every doctor in the country must increase his vigilance so that earlier cases are diagnosed. More urologists must become more proficient in the radical operative treatment of this disease. And, in the meanwhile, the research scientists will continue to follow the clues already found which will eventually lead to the cause. Then, and only then, will the controls and cure of this disease be realized.

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RÉSUMÉ

Le cancer de la prostate est très fréquent chez les hommes dépassant la cinquantaine. En 1941 Huggins démontra la relation qui existe entre cette affection et les substances androgènes de l'organisme. Les auteurs résument les éléments qui permettent le diagnostic et donnent ensuite leur expérience dans le traitement et les conclusions qu'il faut en tirer. Si le diagnostic est posé tôt avant qu'il y ait eu envahissement de la capsule une prostatectomie radicale périnéale s'impose. Il est possible que la castration et les estrogènes en rétrécissant la glande puissent augmenter l'opérabilité de plusieurs cas. La balance bénéficiera d'un traitement aux estrogènes.

YVES PRÉVOST

LIVER BIOPSY IN SARCOIDOSIS

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SARCOIDOSIS is an obscure disease of undetermined etiology, and because of the variability of its manifestations, its diagnosis is often very difficult. A careful correlation of clinical, laboratory, and histological evidence is always necessary, but often, because of the absence of cutaneous lesions or of superficial lymphadenopathy, histological studies are impossible. We have found that the study of liver tissue obtained by needle biopsy is a valuable aid in the diagnosis of this disease.

In 1943, van Beek and Haex[1] reported that the characteristic lesions of sarcoidosis were found in liver tissue aspirated by needle biopsy in two out of four cases that were so diagnosed clinically. Three years later, van Buchem[2] reported positive liver biopsies in 11 out of 14 patients that presented the clinical manifestations of this disease. Volwiler and Jones[3] listed two cases in 1947, and Scadding and Sherlock[4] reported three more in June, 1948.

The diagnosis of sarcoidosis was confirmed by liver biopsy in the three cases described below.

CASE 1

H.T., a 21-year old white male, was admitted to hospital on August 31, 1948, with complaints of a steady, dull, almost constant periumbilical and right upper quadrant pain, of six months' duration. It was aggravated by fried foods and occasionally accompanied by nausea. In addition, he experienced occasional dull pains of 1 to 2 hours' duration, situated medial to the vertebral border of the right scapula. Other associated symptoms included malaise, anorexia, frequent feelings of lightheadedness, and four incidents of syncope. Functional enquiry was otherwise negative and his past history non-contributory. Examination revealed a well developed and well nourished young male. He was tense and anxious, and except for a tender but normal sized liver, no abnormalities were noted on physical examination. X-rays of the chest on September 1, 1948 (Fig. 1), revealed an extensive increase in the hilar shadows due to enlarged nodes, as compared with the slight enlargement noted in a film taken at the onset of his complaints. The cholecystogram and x-ray studies of the œsophagus, stomach and duodenum revealed no abnormalities. Intracutaneous injection of 0.1 c.c. of tuberculin diluted 1:10 gave a negative reaction, and three gastric washings were negative for acid-fast bacilli on smear and culture. Urinalyses, routine blood studies, and the Kahn were normal, as was the electrocardiogram. Results of other laboratory tests are listed in Table I. Bronchoscopy, and x-ray examination of the hands and feet, revealed no abnormalities.

On September 24, 1948, an almond-sized gland in the left axilla and small cervical glands were noted. Histological study of the biopsied axillary gland revealed evidence of chronic lymphadenitis. On October 11, the liver edge became palpable two fingerbreadths below the costal margin in the midclavicular line. Study of serial sections of liver tissue obtained by needle biopsy revealed five very minute granulomatous lesions scattered in various parts of the liver lobule, one of which is shown in Fig. 2. Because of this finding, serial sections were made of the biopsied axillary gland and revealed granulomatous lesions consistent with those of sarcoidosis (Fig. 3).

Hilar lymphadenopathy was a common finding in 11 out of the 14 cases of sarcoidosis reported by van Buchem,[2] and in 8 of these, granulomatous lesions were observed in liver tissue obtained by needle biopsy. Hilar lymphadenopathy was also a feature in Case 1 and in Case 2 described below. Thus it would appear that in patients with otherwise unexplained hilar lymphadenopathy, needle biopsy of the liver may be a valuable diagnostic procedure.

During the summer of 1946, J.P., a 52-year old white male, began to experience fairly sharp, steady, deep-seated pains, situated in both scapular regions, which lasted for 1 to 5 hours at a time. The pain persisted for 1 to 3 days and was followed by periods of freedom lasting 1 to 2 months. There were no accompanying symptoms, nor were there aggravating or alleviating factors. In June, 1947, he noted some lack of energy and in January, 1948, he began to experience a constant "tightness and heaviness" over the entire anterior chest, which persisted. On June 19, he was awakened by similar but more severe pains as described above which

TABLE I.

Laboratory tests (normal values)	*Case 1 H.T.*	*Case 2 J.P.*	*Case 3 G.W.*
1. Total serum protein (6.0 to 8.0 gm./100 c.c.) Albumen/globulin (3.4 to 6/1.5 to 3.0 gm./100 c.c.)	13.9.48 7.2 4.7/2.5 14.10.48 7.3 5.0/2.3	23.7.48 7.1 4.6/2.5 2.11.48 8.2 5.3/2.9	9.11.48 7.0 3.8/3.2 17.12.48 7.4 4.3/3.1
2. Cephalin cholesterol flocculation (0 to +)	14.10.48 +, 15.10.48 0 31.12.48 0	2.11.48 0 1.12.48 0	6.11.48 + 26.11.48 +++ 1.12.48 ++ 17.12.48 +
3. Thymol turbidity (0 to 4.7 units)	31.12.48 6.4	1.12.48 7.5	1.12.48 11.1 17.12.48 8.0
4. Prothrombin activity (80 to 100%)	14.10.48 86 25.10.48 100	2.11.48 76 2.12.48 100	19.11.48 100 2.12.48 100 15.12.48 60 20.12.48 76
5. Total serum cholesterol (170 to 250 mgm.%)	14.10.48 185	2.11.48 315 1.12.48 268	19.11.48 168 1.12.48 170
6. Bromsulphalein dye retention (up to 10% in 30 min.)	14.10.48 4.5	2.12.48 27.5 28.12.48 15.0	2.12.48 3.0
7. Serum calcium (9 to 11 mgm.%)	13.9.48 10.7	1.12.48 10.3	19.11.48 9.8
8. Serum phosphorus (3.0 to 4.5 mgm.%)	15.12.48 3.3	1.12.48 3.6	19.11.48 3.8
9. Serum alkaline phosphatase (3 to 13 King units)	13.9.48 7.3 14.10.48 8.5	2.12.48 6.5	2.12.48 9.3

radiated to the upper axillæ and over the upper anterior chest bilaterally. The pain, worse on the left side, was aggravated by breathing, and except for shortness of breath due to pain, there were no other accompanying symptoms. Movement of his upper extremities afforded some relief. Examination on admission to hospital on June 20, 1948, revealed an obese male with only marked palmar erythema and a temperature of 99° F. X-ray examination of his chest (Fig. 4) revealed extensive scattered infiltration of both upper lung fields with considerable enlargement of both hilar shadows due to lymph nodes. His pain subsided in a week, the intermittent fever to 99.6° F. returned to normal after two weeks, and he remained asymptomatic thereafter. Five sputum and five gastric washing samples were negative for acid-fast bacilli on smear and culture, and no fungi could be demonstrated. The Hb. was 98% and the white blood cells ranged from 9,200 to 14,500 with 3 to 6% eosinophils. The blood Kahn was negative and the sedimentation rate (W/1 hr.) ranged from 6 to 40 mm. with an average of 22 mm. A positive reaction followed intracutaneous injection of 0.1 c.c. of tuberculin diluted 1:100.

After a period of complete bed rest for five months on the basis of a provisional diagnosis of pulmonary tuberculosis, a liver biopsy was performed. Histological study revealed moderate fatty degeneration of the liver, with an unusual collection of cells, which it was felt, warranted a further biopsy. The second biopsy revealed lesions similar to those seen in Case 1 (Fig. 5). Radiological examination of the hands revealed no abnormalities, but small areas of superficial erosion on the

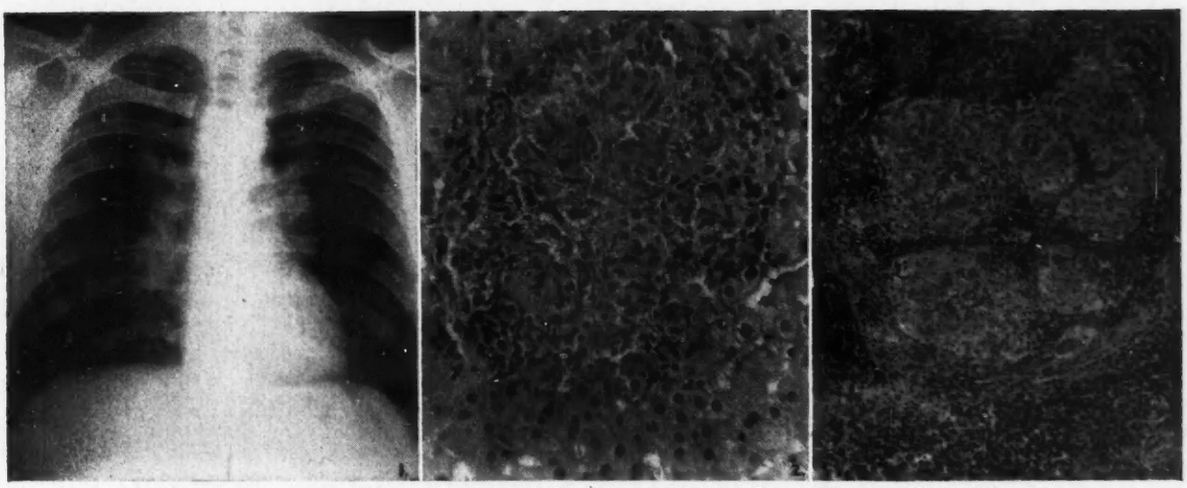

Fig. 1. (Case 1).—X-ray showing hilar lymphadenopathy. **Fig. 2.** (Case 1).—Liver biopsy, hæmatoxylin and eosin; x430, showing a discrete granulomatous lesion. **Fig. 3.** (Case 1).—Axillary lymph node; hæmatoxylin and eosin; x100, showing granulomatous lesions.

medial side of the heads of both first metatarsals were present. Results of other laboratory tests are noted in Table I.

It is of interest to note that van Buchem[2] performed liver biopsies in 9 patients suffering from an active exudative form of pulmonary tuberculosis, and in none was a specific abnormality found in the liver tissue examined. Nevertheless, it is not unreasonable to expect that by liver biopsy, one might find lesions similar to those of sarcoidosis in other disseminated granulomatous diseases, such as miliary tuberculosis or brucellosis. Thus the importance of correlating clinical, laboratory and histological findings is evident.

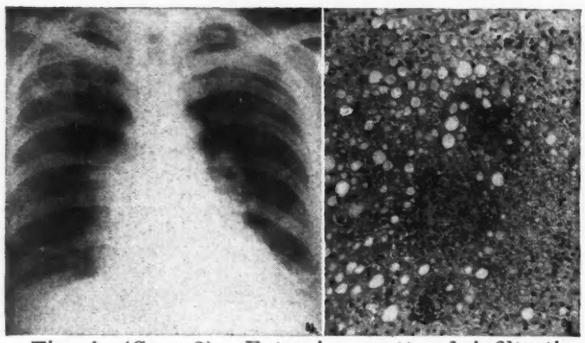

Fig. 4. (Case 2).—Extensive scattered infiltration of both upper lung fields and hilar lymphadenopathy.
Fig. 5. (Case 2).—Liver biopsy, hæmatoxylin, x100, showing discrete granulomata and moderate fatty degeneration.

CASE 3

G.W., a 34-year old white male, experienced several head and chest colds associated with a painful stiffness of his neck during the winter of 1942. Radiological examination of the chest was normal in May, 1943. During the winters of 1943 and 1944 he again experienced many head and chest colds, each lasting about 3 weeks and associated with 3 to 4 oz. of yellowish-green sputum a day. Since 1945, these respiratory infections gradually increased in duration and severity, so that on admission to hospital on November 2, 1948, his cough was productive of 6 to 8 oz. of thick, greenish sputum daily. Between exacerbations, his chronic cough was productive of small amounts of white or yellowish sputum. His exercise tolerance, though variable, had diminished gradually since the autumn of 1945, so that on admission to hospital, he was confined to bed. Enquiry revealed that during the autumn of 1945, he began to experience excessive perspiration and headaches. The constant dull, constricting "hat-band" headache, aggravated by movement or coughing, was associated with photophobia and persisted until June, 1948. In March, 1946, he began to suffer variable and alternating periods of chilliness, followed by intermittent fever up to 103° F. accompanied by profuse perspiration. Loss of energy, weakness, anorexia, with loss of 32 lb. in weight, were associated symptoms. His appetite returned after four months but the weight loss persisted. In June, 1946, he first experienced chest pains, which were dull, sharp or stabbing, and generalized, although mainly over the left upper chest anteriorly. They were neither aggravated nor relieved by known causes, and along with the periods of chilliness and fever persisted until January, 1948.

Examination on admission revealed a thin, pale, cyanotic male in respiratory distress, with rapid and shallow breathing. His temperature was 101.8° F. and pulse rate 120. His upper chest appeared flattened, the subcostal angle was widened, and there was indrawing of both supra- and infraclavicular fossæ associated with a generalized poor chest expansion (35 to 36"). The trachea was in the midline. Medial to the vertebral borders of both scapulæ, there was increased tactile fremitus, dullness to percussion, and bronchial breathing. Over the right lower axilla and lower right base posteriorly, slight dullness to percussion, diminished breath sounds and decreased tactile fremitus was noted. The remainder of the chest was hyper-resonant to percussion. Diaphragmatic excursion was good. Many fine and medium inspiratory râles, and medium pitched inspiratory rhonchi were audible over both bases. There was a moderate increase in venous pressure, the heart was normal in size, the rhythm regular, and there were no murmurs. Accentuation of the pulmonary 2nd sound was marked. Blood pressure 100/60. A lobulated rubbery, freely movable superficial lymph node was palpable just above the right clavicle at the lateral edge of the sternomastoid muscle. With the exception of small epitrochlear nodes, no other lymphadenopathy was noted. Early clubbing of the fingers was evident, the

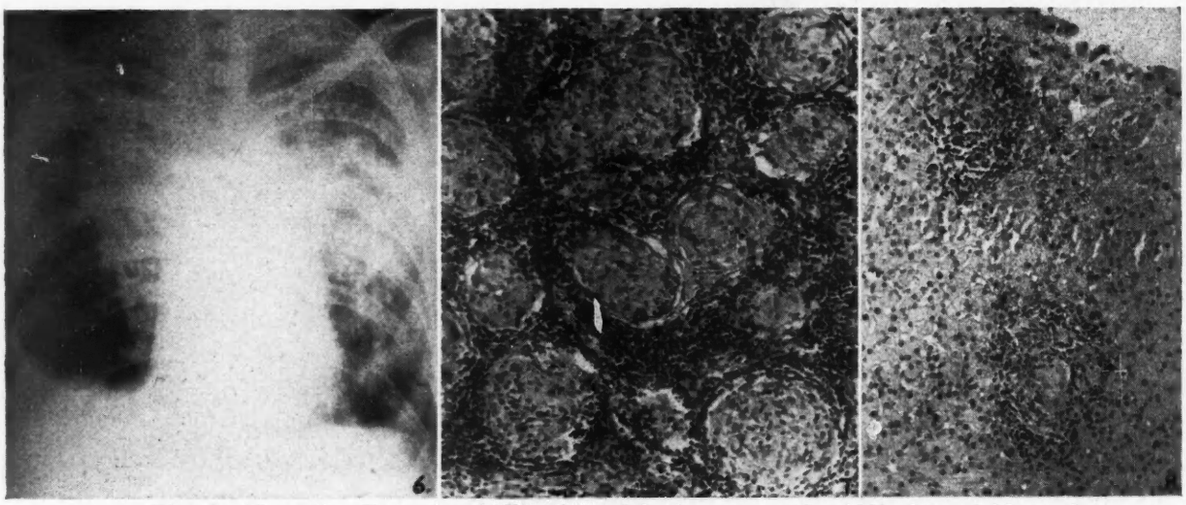

Fig. 6. (Case 3).—Extensive infiltration of both upper and middle lung fields, and obliteration of right costophrenic angle. **Fig. 7.** (Case 3).—Supraclavicular lymph node; hæmatoxylin and eosin; x100, showing several discrete granulomatous lesions. **Fig. 8.** (Case 3).—Liver biopsy; hæmatoxylin and eosin, x100, showing 2 granulomatous lesions with giant cells.

liver was not palpable and physical examination revealed no other abnormalities.

The Hb. was 92% and white blood cell counts varied from 7,500 to 15,500 with 5 to 13% eosinophils. The urinalysis, non-protein nitrogen, blood Kahn was normal and the electrocardiogram showed right axis deviation. Sputum studies revealed no predominant organism, and 3 sputum and gastric washing samples proved to be negative for acid-fast bacilli on smear and culture. X-rays of the chest (Fig. 6) revealed extensive infiltration of both upper and middle lung fields, and obliteration of the right costophrenic angle, which was considered due to thickened pleura in view of a negative thoracentesis. X-rays of the hands and feet revealed no abnormalities. A tuberculin test with a 1:10 dilution was negative. Results of other laboratory tests are listed in Table I.

As a result of therapy with intramuscular and aerosol penicillin, the temperature became normal 3 days after admission, and remained so, except for an occasional rise up to 101° F. Much symptomatic improvement followed; the venous pressure became normal, the sputum was reduced from 6 to 2 oz. daily, but no change in roentgengrams of his chest occurred.

Biopsy of the supraclavicular node revealed the entire structure studded with small discrete granulomatous nodules compatible with sarcoidosis (Fig. 7). Liver biopsy revealed similar nodules (Fig. 8). It was felt that sarcoidosis, associated with probable pulmonary fibrosis, bronchiectasis, emphysema, and cor pulmonale, indicated a poor prognosis.

DISCUSSION

In only the first patient was the liver palpable, and in all 3 cases, the van den Bergh, urinary bile and urobilinogen values were normal. With the exception of the slightly abnormal thymol turbidity, no evidence of liver disease could be demonstrated by the liver function tests employed in Case 1. The abnormal bromsulphalein dye retention in Case 2 was possibly related to the fatty degeneration noted (Fig. 5). Laboratory evidence of liver disease was present in the third case (Table I). All serum calcium and phosphorus estimations were normal. Harrell and Fisher[5] found the serum alkaline phosphatase to be elevated in "all (eight) active cases", that they studied but could not correlate the rise with the extent or activity of the bone lesions or with the serum calcium changes. There was no abnormality in the serum alkaline phosphatase in the 3 cases described.

Study of serial sections of liver tissue aspirated by needle biopsy in the 3 cases (Figs. 2, 5 and 8) revealed that the small granulomatous lesions were scattered in various parts of the liver lobule. The granulomas consisted of epithelioid cells and a sprinkling of lymphocytes with a slight tendency to peripheral location evident in Fig. 5. There was no necrosis or caseation. Grouping of the epithelioid cells in Fig. 2 suggested attempted giant cell formation, and giant cell formation could be demonstrated in the serial sections of the third case (Fig. 8). In his description of the typical sarcoid lesion, Freiman[6] stated that eosinophils were "practically never present". It is of interest that eosinophils were scattered throughout the granulomas in liver tissue of all 3 cases, and were present in large numbers in the first two (Fig. 2 and 5).

SUMMARY

The importance of needle biopsy of the liver as an aid in the diagnosis of sarcoidosis has been noted, and the findings in three cases have been described.

We wish to express our thanks to Dr. M. V. Rae, Pathologist, Shaughnessy Hospital, for her help in the preparation of this paper.

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PULMONARY TUBERCULOSIS IN THE OLDER AGE GROUPS*

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IN recent years there has been more and more emphasis on tuberculosis case-finding through surveys conducted by anti-tuberculosis associations, industrial clinics, welfare organizations and many like agencies.

In addition, in this country and in the United States, more and more hospitals are establishing routine admission x-ray programs. In the majority, the concentration has been on the public out-patients. In some hospitals, more emphasis has been placed on obstetrical cases. Very few have what may be called a complete program. In many, there has been a deliberate, and in others an indirect, policy of concentrating on tuberculosis case-finding in the young adult age group. In fact, in some of the surveys in the United States, definite age

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TABLE I.

Case No.	*Occupation*	*Age at present*	*Age on diagnosis*	*Sputum on adm.*	*Sputum now*	*Type of lesion*	*Treatment*	*General progress*	*Remarks*
1,237	Nil	59	52	Positive smear, positive culture	Positive smear, positive culture	Far advanced, bilateral, fibrocavernous	Bed rest	Poor. Has developed T.B. spondylitis.	Was in hospital 1 week in 1934 because of chest complaints. No definite diagnosis until 1949.
1,383	Nil	73	72	Positive smear, positive culture	Negative smear, positive culture	Far advanced, bilateral, fibrocavernous with atelectasis and emphysema	Bed rest	Stationary	Diagnosed while in hospital for treatment of prostatism.
1,194	Nil	65	64	Negative smear, positive culture	Negative smear, negative culture	Moderately advanced, granular and linear shadows, no cavity	Bed rest	Fair	Diagnosed while under treatment for bronchial asthma.
1,329	Nil	57	57	Negative smear, positive culture	Positive smear, positive culture	Minimal, bilateral, nodular	Bed rest	Fair	Many previous hospitalizations. Diagnosis on routine chest x-ray.
1,213	Nil	59	59	Negative smear, positive culture	Negative smear, negative culture	Far advanced, bilateral, diffuse granular shadows.	Streptomycin	Good	Routine x-ray during investigation of hoarseness.
1,230	Hospital orderly	53	52	Negative smear, positive culture	Negative smear, negative culture	Minimal, bilateral with apical cavities	Bed rest	Good	Routine chest x-ray.
1,262	Odd jobs	66	65	Negative smear, positive culture	Positive smear, positive culture	Moderately advanced, bilateral with apical cavity.	Streptomycin	Fair	Routine chest film during investigation of arthritis. Tonsillectomy 1 year before—no x-ray.
1,472	Odd jobs	68	68	Negative smear, positive culture	Negative smear, positive culture	Moderately advanced, granular and linear shadows. No cavity.	Bed rest	Has regressed slightly	1942, hæmoptysis, Investigation negative. 1946, known tbc. contact. 1949, diagnosed on routine survey.
1,115	Odd jobs	55	54	Positive smear, positive culture	Positive smear, positive culture	Far advanced, bilateral, fibrocavernous	Streptomycin	Stationary	No previous illness. Complained of hoarseness.
1,057	Moulder, hospital orderly	59	56	Positive smear, positive culture	Negative smear, negative culture	Far advanced, bilateral, fibrocavernous	Streptomycin	Good	Stopped working as moulder in 1943, "he did not feel well". Worked as hospital orderly until T.B. discovered by routine chest x-ray in 1946.
1,389	Clerical	57	57	Positive smear, positive culture	Negative smear, negative culture	Moderately advanced, bilateral, granular and calcific disease. No cavity.	Bed rest	Good	Had been below par for 2 years—finally went to hospital.
1,201	Odd jobs	58	57	Negative smear, positive culture	Negative smear, negative culture	Far advanced, bilateral, fibrocavernous. Severe T.B. laryngitis	Streptomycin	Good	Admitted with diagnosis of syphilitic laryngitis. Had had no x-ray.
1,109	Tar distiller	54	51	Positive smear, positive culture	Negative smear, positive culture	Far advanced fibrocavernous, bilateral	Pneumothorax thoracoplasty	Fair	Discovered in an industrial survey. Previously told he was healthy.
1,055	Nil	63	60	Positive smear, positive culture	Negative smear, negative culture	Far advanced, bilateral, fibrocavernous	Streptomycin	Good	T.B. diagnosed 1936—3 months' treatment. Re-discovered in 1946 while in hospital for "neurasthenia".
1,405	Hospital orderly	55	54	Negative smear, positive culture	Negative smear, negative culture	Moderately advanced, fibrocavernous	Thoracoplasty	Good	Discovered on routine x-ray.
1,188	Odd jobs	55	52	Positive smear, positive culture	Positive smear, positive culture	Far advanced bilateral, fibrocavernous	Streptomycin	Stationary	Discovered on routine survey. Believed himself healthy.
1,473	Odd jobs	64	64	Positive smear, positive culture	Positive smear, positive culture	Moderately advanced, apical disease with cavity.	Streptomycin	Fair	Under care of a doctor for some time—no x-ray.

TABLE I. — *Continued*

Case No.	*Occupation*	*Age at present*	*Age on diagnosis*	*Sputum on adm.*	*Sputum now*	*Type of lesion*	*Treatment*	*General progress*	*Remarks*
686	Odd jobs	60	54	Negative smear, positive culture	Occasional positive culture	Minimal, fibrotic	Bed rest	Good	Was under investigation for cardio-renal disease when x-ray revealed tuberculosis.
1,469	Clerk	61	61	Positive smear, positive culture	Positive smear, positive culture	Moderately advanced, with cavity	Bed rest	Stationary	Admitted to hospital in cardiac failure. Tuberculosis discovered.
1,208	Cook	59	56	Occasional positive culture	Occasional positive culture	Moderately advanced, granular lesions, no cavity	Streptomycin	Good	"Chronic bronchitis" since 1919.
1,207	Nil	62	61	Negative smear, negative culture	Negative smear, positive culture	Nodular disease, left apex with cavitation	Bed rest	Poor—extending	Discovered while under treatment for tabes dorsalis.

limits have been placed, and individuals under the age of ten years and over the age of fifty years have been excluded from many of the case-finding programs. A notable exception has been the Province of Ontario, where the Division of Tuberculosis control has instituted a program of routine admission x-rays in all hospital admissions over twelve years of age.[1]

We feel that it will be of interest at this time to point out that pulmonary tuberculosis, and particularly pulmonary tuberculosis with positive sputum, is by no means restricted to young adults; and further, that pulmonary tuberculosis can and does occur in the older age group in an early stage. Many cases of minimal or moderately advanced lesions with positive sputum have come to our attention in individuals over 50 and even over 60 years of age. This is in keeping with recent findings in public health reports from all over America. The maximum incidence of tuberculosis morbidity and mortality, particularly in men, is slowly shifting from the young adult to the middle age group.

An interesting finding in our series is that many of them have only become aware of their disease through a routine case-finding program, after having been admitted to hospital for surgical procedures entirely unrelated to their chest condition. In many of them, only a very careful history has brought out symptoms referable to their pulmonary disease.

There has been a tendency in many hospitals to operate by a rule of thumb, that when considering a single chest film, one thinks of tuberculosis if the individual is under forty, and of neoplasm if he is over forty. We fear that in many cases so much emphasis has been placed on the incidence of neoplasm in the over-forties that students are not sufficiently aware of the fact that tuberculosis must be considered. In fact, in several cases, senior students have expressed surprise that pulmonary tuberculosis can even exist in the older age group, except as old disease long under treatment.

We would also note the paucity of clinical symptoms other than those of "chronic bronchitis" in this older age group who have well-marked parenchymal lesions.

Of particular interest, not only to anti-tuberculosis groups, but to those responsible for hospital admission surveys, is the high percentage of positive sputa in these older patients. They constitute a definite menace not only to their household contacts, but to staff and other patients in hospitals.

At St. Hyacinthe Veterans' Hospital, a tuberculosis sanatorium of 200 beds, 39 patients were found to be over 50 years of age, out of a total population of 175 (22%). Five cases were discarded because their tuberculosis had been discovered before they were 50, and had been under continuous treatment since. A further three were discarded because they had radiologically stable lesions from which tubercle bacilli have never been isolated. This leaves 31 patients with active, sputum-positive tuberculosis which was discovered when the patient was over 50 years of age (19% of total population).

The average age at the present time is 59.6 years. The average age at the time of diagnosis was 57.6 years. All of them are, or have been, positive on sputum culture for *myco. tuberculosis*: 20 of them have been positive on smear.

In seven, the tuberculosis was diagnosed during investigation of chest complaints. Three were under investigation for hoarseness. Five were sufferers from "chronic bronchitis". The remainder were diagnosed as a result of routine survey or during investigation of other complaints.

Fourteen have received streptomycin, one pneumothorax, two pneumoperitoneum and two thoracoplasty. All received routine sanatorium rest. In seven the sputum is now negative, and in four it is "occasionally positive". Two have shown marked improvement in the x-ray, and seven considerable improvement. The remainder have remained relatively stationary, except one who has died. The average duration of treatment at this hospital is just under two years.

Brief summaries of representative cases are presented in Table I.

SUMMARY

22% of patients in a tuberculosis hospital were found to be over 50 years of age.

19% had active, sputum-positive tuberculosis which was discovered after the age of 50.

Only a few presented chest symptoms which led to their diagnosis. The majority had been diagnosed by routine x-ray.

The average age at the time of diagnosis was 57.6.

Representative case synopses are presented.

REFERENCE

1. BRINK, J. S. AND HOLLING, S. A.: Medical Papers of the Canadian Tuberculosis Association, 1949.

MODERN METHODS OF TREATMENT FOR MALIGNANT TUMOURS OF THE EYE*

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ALTHOUGH there has been little change in the treatment of tumours of the eye during the last decade, a review of the previous methods together with a description of some of the more advanced methods although still in an experimental stage should serve a useful purpose.

* Read at the Eighteenth Annual Meeting of the Canadian Medical Association, Section on Ophthalmology, Saskatoon, June 15, 1949.

A diagnosis of malignancy of the eye throws a heavy responsibility on the shoulders of an ophthalmologist. Such a responsibility should not be borne alone. It is a wise oculist who will consult with one or more of his colleagues to confirm or reject his diagnosis. It is difficult to evaluate the various methods of treatment due to the time interval necessary to constitute a cure. The mortality rate even with the best known treatment is extremely high, and it is important of course that the patient be given the advantage of any improvements in technique as they become available.

Seven cases are presented where a radium insert was made directly after the removal of the eye. It is felt that in so doing the radium rays would come in active contact with any tumour cells which might have been expressed by the manipulation necessary in removing the eye, and would be destroyed before they could escape by the blood vessels or lymphatics.

The three most important malignant tumours of the eye are the melanomas, retinoblastomas and carcinomas. The melanomas were originally called sarcomata, leucosarcomata, or melanosarcomata. Masson in 1926, Laidlaw and Murray in 1933, and Theobald in 1937 ascribed to these neoplasms a neurogenic origin. There is every reason to believe that the malignant tumours of the uveal tract, whether pigmented or not, are essentially neoplastic developments from the cells of the sheath of Schwann, and are therefore neuro-ectodermal in origin and are thus called melanomas.

MELANOMATA OF THE IRIS

Melanomas of the iris may be formed by proliferation of the ectodermal epithelium; a second type occurs not uncommonly, especially in blue and grey irides, in the stroma. Such nævi are congenital. Their usual habit is to grow very slowly in the earlier years of life, and later spread over the surface of the iris and into the ciliary body. This type is usually accompanied by glaucoma. The occurrence of glaucoma in an eye with a nævus should therefore be looked upon with the greatest suspicion. Samuels emphasized the importance of serological tests and x-rays to rule out the possible presence of a foreign body. The degree of malignancy cannot be determined by the age of the patient, as a malignant melanoma of the iris has been found in a child of six months.

Pigmented tumours of the iris involving only the area around the pupil may be treated by a wide iridectomy and the tumour tissue carefully sectioned for evidence of active growth. Where the iris base is involved enucleation with radium bomb implant is the preferred method.

The choroidal nævus is probably more common than the literature would suggest (Duke-Elder). It appears as a roughly circular bluish or slate-grey patch of homogeneous texture, with somewhat feathered edges, usually about the size of the optic disc, and is generally situated near the posterior pole of the eye. Over it the retinal vessels course normally, and give rise to no symptoms. Choroidal nævi should be carefully watched for any signs of extension, as they have been known to assume malignant characteristics.

MELANOMATA OF THE CHOROID

Melanomas of choroid occur in about 0.02 to 0.06% of all eye patients, that is two to six per ten thousand patients. There is no special incidence; the average incidence is about 50 years; hereditary influences are little in evidence. Injury has been thought to have a bearing on the incidence. There is more evidence that prolonged inflammation may be a determining factor, owing to the occurrence of malignant melanomata in shrunken phthisical eyes.

A melanoma of the choroid first appears as a lenticular or elliptically-shaped neoplasm in the outer layer of the choroid. Upon rupture of Bruch's membrane, which has been impeding its forward spread, the tumour mushrooms forward in all directions, forming the characteristic globular head. At this stage the retina has become detached and the subretinal space is filled with a richly albuminous fluid formed partly by venous obstruction and partly by irritative reaction. The detachment thus caused may easily be mistaken for a simple detachment.

Treatment for melanomas of the choroid is enucleation with as long an optic stalk as possible. I do not agree with the usual practice of exenteration of the orbit if retro-bulbar nodules or evidences of extra-ocular extension are found. If the tumour growth is extra-ocular, there is more likelihood of spreading the malignant cells during the process of removing the orbital contents. It is felt that the minimum amount of trauma with the insertion of a radium bomb at the time of enucleation gives the best chance of success.

MALIGNANT MELANOMAS OF THE BULBAR CONJUNCTIVA

Congenital pigmented flecks on the bulbar conjunctiva are not uncommon, and rarely become malignant. However, Reese reported several cases of this type on which a diffuse malignant melanoma developed during later life. Others have reported similar cases. Conjunctival nævi act similarly to nævi on other parts of the body. Clinically they appear as slightly raised tumours adjacent to the cornea, usually flesh-coloured or pink or yellowish-brown, the shade depending upon the amount of melanin present. The tumour is firmly attached at the limbus, but is freely movable with the conjunctiva. The tumour growth should be excised widely and beta radiation applied. A new applicator containing beta rays from radium D should be used, which has a usefulness of over twenty years, whereas the radon seeds lose their potency in a few days. The chief value of the new beta rays is their relative safety, as they contain no gamma rays. Where there is evidence of extension, enucleation with radium application should be considered.

RETINOBLASTOMATA

A retinoblastoma or glioma retinæ is the only important neoplasm to affect the retina. This malignant tumour arises in youth, usually from the posterior part of the retina. It is composed of closely packed round or polygonal cells with large darkly-staining nuclei, and scanty cytoplasm. A radial arrangement around blood vessels to form pseudo-rosettes is common, degenerative changes are frequent, and, as would be expected owing to the embryonic nature of the cells, malignancy is high, usually by local extension to the brain and orbit, and sometimes by distant metastasis. It is the only tumour of neuroretinal origin known to metastasize to distant parts.

Retinoblastoma are formed by primitive retinal cells and are thought to arise from these cell rests. The disease occasionally shows a marked familial or hereditary characteristic, occurring in several generations of the same family. The incidence of bilateral involvement is high, and it is now thought that at least one out of every four cases will have an

involvement of the other eye. Reese, in his series, found that bilateral involvement occurred in considerably more than 25% of cases.

In cases of bilateral retinoblastoma the tumour in the opposite eye should be demonstrated at the time the lesion is recognized in the first eye. The lesion in the first eye is seldom recognized until it has advanced sufficiently to cause a definite impairment in vision or a white reflex visible through the pupil. A careful examination under general anæsthesia should be made through a widely dilated pupil. A small tumour growth near the periphery in the opposite eye could easily be missed unless a careful search is made. This fundus examination should be repeated again in a few weeks. The assumption should be that the fellow eye is affected until it is conclusively proved otherwise. Retinoblastoma should not be confused with a pseudo-glioma, which is inflammatory in nature.

The preferred treatment for cases where the tumour is found in only one eye is enucleation. Due, however, to the fact that extension usually occurs through the optic nerve, it is now considered advisable that previous to the enucleation a neurosurgeon should incise the nerve distal to the optic chiasma and push the distal end into the orbital cavity. Then after a lapse of two weeks the eye is enucleated, together with the entire optic nerve. It is hoped that this procedure will reduce the possibility of recurrence.

Where tumour growths are bilateral, after enucleation of the one eye some form of radiation of the opposite eye should be undertaken. Reese, A. B., Merriam, G. R. Jr. and Martin, H. E. (*Am. J. Ophth.*, **32**: 175, 1949) reported results of treatment of 53 cases of bilateral retinoblastoma treated by x-ray radiation, using a very small target. Their statistics are very encouraging, showing 47.2% are living, with 20/200ths vision or better. The technique is not too difficult to be carried out in some of our larger medical centres where radiologists are equipped to give deep therapy treatments. The maximum total dosage is 8,000 r x 2 (in air), with 400 r (in air) as a single dose. Two positions of portals are used, temporal and nasal, with treatments three times a week.

Waldman and Shannon reported a cure with the use of radon seeds. This method was devised to overcome the difficulties that may be encountered in inserting radon seeds directly into the tumour, or in applying them embedded in dental stent, to the overlying sclera of the posterior part of the globe in cases of retinoblastoma, as described by Stallard. Briefly, the method of application of a thin semi-pliable chromium-plated or rhodium-plated silver band applicator containing depressions in the distal end, into which the required number of radon seeds fit. This is applied to the sclera over the site of the tumour mass, and left in for the required length of time.

Carcinomas of the eye are seldom if ever primary, but metastasize from some other part of the body. Active treatment is not indicated, and the surgeon should do everything he can to keep the patient comfortable.

CASE 1

F.R., aged 36 years. Applied for treatment October, 1940. During the past year had noted a blind spot in left eye which slowly increased in size. Fundus examination showed a retinal detachment involving the lower temporal area, which did not transilluminate.

An enucleation was done and radium needles embedded in dental wax to form a ball approximately 16 mm. in diameter was inserted in tenon's capsule, and a purse-string suture closed the wound. Five needles containing 25 mgm. of radium were used: filtration 0.5: time 32½ hours, making 812 mgm. hours.

The next day the patient was taken to the operating room, the purse-string was loosened, the radium bomb removed, and a glass ball substituted. The wound healed without incident, and after nearly nine years there has been no recurrence.

Pathological report: section shows a greyish, slightly blackish tumour mass just lateral to the nerve head, about 8 cm. in width. The choroid bulges before it and is roughly about 0.5 cm. in thickness. Microscopically the tumour shows sheet-like masses of spindle-shaped cells with frequent mitolic figures and large chromophore cells. There is a very fine loosely arranged intracellular substance. The tumour is well vascularized by fairly large thin-walled, almost sinus-like channels, but on the whole the growth is well circumscribed and there is no suggestion of infiltration into the various coats of the eyeball or optic nerve. Diagnosis—melanoma of the choroid.

CASE 2

S.S., aged 78. Applied for treatment September, 1940. Had lost sight of left eye 25 years previously. For past 20 years has worn a prosthesis over O.S. with considerable irritation. Marked pain O.S. for the past two weeks. Cornea was opaque, eye was hard, with deep episcleral injection. Small superficial growth on limbus at 6 o'clock. Diagnosis—melanoma of the choroid.

An exenteration was done and radium bomb inserted for 750 mgm. hours. The patient died ten months later. Cause of death could not be determined.

CASE 3

H.H., aged 25 years. Applied for treatment February, 1945. Patient had been operated on four years previously for a retinal detachment, following which there was no restoration of vision and the eye continued to be inflamed and painful at times. One year previously the patient had noticed a dark lump on the sclera of the eye, which gradually increased in size. When seen, the eye was deeply injected and fixed, and the cornea was vascularized.

At operation difficulty was experienced in removing the eye due to a large tumour mass which had ruptured through the scleral coat and was adherent to Tenon's capsule. Some of the tumour tissue remained and was incised separately. Following the enucleation a radium bomb was inserted and 1,000 mgm. hours of radium given. Several weeks later this was followed by a fairly intensive radiation of the area with x-rays.

Pathological report showed a typical melanoma with cells largely spindle-shaped. Patient well and healthy, no evidence of recurrence.

CASE 4

R.K., aged 3 years. August, 1945. Parents first noticed the child was unable to see out of left eye at the same time they noticed a grey-green reflex in the pupillary area. Fundus examination showed a retinoblastoma with no evidence of tumour growth in opposite eye. Enucleation with radium bomb implant was done. 500 mgm. hours were given. Diagnosis: retinoblastoma. Section through the optic nerve did not show any evidence of tumour cells. The child is well and healthy.

CASE 5

Mrs. J.Mc., aged 68 years. June, 1946. First noticed flashes of light with gradual loss of useful vision—no pain. Enucleation with radium bomb for 750 mgm. hours was followed in twenty-four hours with a basket implant. Section showed typical melanoma of round or polyhedral cell type. Basket had to be removed three months later due to discharge with retraction of the tissue around the basket. Patient well, with no recurrence to date.

CASE 6

R.McA., aged 2. July, 1946. Parents noted a peculiar appearance of the right eye. Fundus examination under general anæsthetic showed large tumour mass near the posterior pole. The left eye was negative. Enucleation with radium bomb for 500 mgm. hours was followed twenty-four hours later with a glass ball implant.

Pathological report showed round cells with hyperchromatic nuclei. No tumour cells were found in sections from the optic nerve. Diagnosis: retinoblastoma. Child is well and healthy. Glass ball apparently caused no irritation but was extruded 3 months later.

CASE 7

Mrs. H.S., aged 54. June, 1947. Patient reported loss of vision with pain in O.D. Enucleation was followed by radium bomb using five 5-mgm. radium needles: filtration 0.5 embedded in dental wax: time 24 hours. Glass ball was inserted after removal of the radium bomb.

Diagnosis: melanoma of spindle cell type. There was no evidence of extension through the optic nerve. Patient well and healthy at present time.

SUMMARY

Treatment of melanomata of the choroid consists first in removal of the eye. Lehrfeld in 1942 suggested retrobulbar injections of alcohol prior to enucleation on the basis that alcohol destroys nervous elements, and that malignant melanomata are derived from nerve cells. If alcohol as a denaturing agent is injected during the early stages when the tumour is still confined within the globe, it might render it more sensitive to treatment by radium, and x-ray. Melanomata are slow-growing, so no time would be lost. However, I can find no reference in the literature to any testing of this method.

The use of the radium bomb is not new. It has the advantage of applying radium emanations directly to the area where tumour cells are most likely to be found, and is followed by the minimum amount of local reaction in the skin and superficial tissues. It does not preclude the use of deep x-ray therapy to that area. In approximately half the cases, the glass ball implant was extruded in one to three months following the operation. In several cases these have been re-inserted and have been retained.

The radiation in milligram hours varied from 500 mgm. hours in the case of the child aged two, to 1,000 mgm. hours in the case of an adult. The only reaction was a slight swelling which disappeared in a few days.

The work of Reese and associates in the treatment of bilateral retinoblastomas by x-ray using two positions of portals and a very small target is highly commendable, and their average of cures with 20/200ths vision or better over a five-year period lends a bright ray of hope in an otherwise hopeless situation.

The use of radon seeds over the site of the tumour may well prove to be a forward step, but as yet the technique and proper dosage have not been established.

925 W. Georgia

HOMOLOGOUS SERUM HEPATITIS

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HOMOLOGOUS serum hepatitis (homologous serum jaundice, serum hepatitis) is a disease characterized by hepatitis, usually accompanied by jaundice, clinically resembling infectious hepatitis but differing immunologically, and resulting from the parenteral administration into the body of homologous serum containing an icterogenic virus. The condition will be briefly discussed and three illustrative cases presented.

The following short historical sketch is summarized from the papers of MacCallum and Bradley.[1, 2] In 1937, MacNalty described jaundice occurring in children following the administration of convalescent measles serum. Of 109 recipients, 37 developed jaundice and 8 died of hepatic necrosis. About the same time Findlay and MacCallum published their findings of jaundice developing in recipients of yellow fever vaccine. In 1942, cases of jaundice appeared in Ameri-

can troops who had been inoculated against yellow fever. Other observers noted similar developments after administration of mumps and pappataci vaccines. It was evident that the common factor in these vaccines was the fact that they were all made from human (hence homologous) serum, and attention was drawn to the incidence of jaundice following the administration of whole blood and blood plasma, especially with the tremendous increase in the use of these substances during and following the 1939-45 war.

It was further observed that outbreaks of jaundice in treatment clinics or where large numbers of inoculations were being given could be traced to inadequate sterilization of syringes.[3, 4] The icterogenic agent having presumably gained access to the syringe by accidental aspiration of serum or lymph from a patient harbouring the responsible virus thus becomes widely disseminated in future recipients of material from that syringe.

Recently several cases of jaundice following and directly attributable to the use of an infected tattooing needle have been observed.[5]

ETIOLOGICAL AGENT AND DIFFERENTIATION FROM INFECTIOUS HEPATITIS

The etiological agent is a virus which may be designated virus SH (*i.e.*, serum hepatitis) to distinguish it from virus IH (*i.e.*, infectious hepatitis). Virus SH is resistant to 56° C. for 30 to 60 minutes and survives in the frozen state for several years. In the desiccated state at room temperature it is stated to live from 12 to 14 months.[6, 7] In this report, survival of the virus in dried plasma for 4 years is shown.

Experimentally, virus SH must be introduced parenterally into human volunteers to cause the disease (one case only reported of successful inoculation by the intranasal route) in contrast with virus IH which is effective on oral administration. Cross immunity studies also differentiate between the two viruses.[8, 9, 10] Pathologically, examination of liver biopsies by Dible *et al.* showed no recognizable histological characteristics to distinguish the two diseases.[11] Clinically, the two diseases are very similar but are distinguished by the longer incubation period of homologous serum hepatitis (50 to 150 days) compared with infectious hepatitis (15 to 40 days), and by the fact that the former has a more insidious onset with little or no fever.

Aycock and Oren[12] believe the longer incubation period of serum hepatitis may not be evidence of a different virus agent but only of partial neutralization of the virus by admixture with serum (containing antibodies) of either the donor or the recipient. Against this theory are the experiments of Havens[23] in which infective hepatitis produced by the experimental inoculation of infective serum appeared after incubation periods of from 21 to 30 days. The idea of infective hepatitis as a "virus reservoir" for homologous serum hepatitis sounds a very plausible one from a purely clinical standpoint.

Incidence.—Vaughan and associates[13] were able to trace 1,054 living plasma or serum recipients and found that 77 of these had developed jaundice within 5 months. Presuming this was all homologous serum hepatitis, the incidence is 7.3%, an astonishingly high figure.

Brightman and Korns[14] enquired into the incidence of hepatitis in 649 plasma recipients and found it to be 4.5%, the attack rate being significantly greater in persons over 50 years of age where previous hepatic insufficiency seems to render the liver more susceptible to the virus. No correlation was noted between the amount of plasma given and the incidence of the disease. A seven months' survey of upstate New York by the same workers showed 12 deaths attributable to homologous serum hepatitis.

Greaves[15] states that if a known icterogenic batch of plasma or serum is used, the attack rate of homologous serum hepatitis has seldom been found to be greater than 40%, which suggests some degree of immunity in a large section of the general population even though apparently never infected.

Prevention.—(1) Ultraviolet irradiation has been shown by Oliphant and Hollaender[16] and by Blanchard *et al.*[17] to be an effective and practical method of inactivating the virus. Prolonged heating is also effective and a practical measure in the treatment of serum albumen but is unsuitable for whole blood, plasma or serum. Wolf *et al.*[18] have demonstrated that irradiation itself does not so alter the plasma as to cause any reactions in the recipient. Until irradiated plasma is generally available, however, other preventive measures are required. (2) The use of gamma globulin is of questionable value in the prevention of homologus serum hepatitis[19, 20] and does not appear at present to be of any practical use. (3) Size of the plasma pool. Janeway[21] and Loutit and Maunsell[22] have emphasized the risk of large plasma pools. The latter recommend two or three or at most ten donors per lot of plasma. The Canadian Red Cross plasma during wartime was in 200 litre pools and this was later reduced to the present 40 litre pools. The use of irradiated plasma will of course invalidate

the objection to large pools. (4) Avoidance of the use of donors with a recent history of jaundice until at least a year after the disappearance of the jaundice. (5) Care in the use of blood or plasma except where definite indications exist. This is especially applicable to plasma since whole blood (coming from only one or two donors) is infrequently at fault in the transmission of the disease. (6) Adequate sterilization (*i.e.*, by dry heat or boiling) of syringes and needles. The use of separate syringes as well as needles for each patient is desirable although this is admittedly difficult to achieve in large treatment clinics.

CASE 1

Female, aged 25 years, was admitted to the Victoria General Hospital on December 31, 1948, with an ectopic pregnancy. Operation was performed on January 3, 1949, and 400 c.c. of plasma were given. The patient made a good recovery and remained well until about May 1, when she noted her urine becoming dark and her stools light in colour. A week later she lost her appetite, became nauseated, had pain below the right costal margin and, a few days later still, noticed that she was jaundiced. Because her symptoms were mild she did not consult a doctor. However, about this time she was admitted to Camp Hill Veterans' Hospital (R.C.A.F.) (W.D.) for a routine check-up of her chest (7 rib upper left thoracoplasty for pulmonary tuberculosis). Clinically the jaundice was very marked, there was some tenderness below the right costal margin but the liver was not felt. The laboratory reported a very high serum bilirubin, a normal cephalin cholesterol flocculation, a slightly lowered serum albumen (3.08 gm. %), a slightly raised serum globulin (3.82 gm. %) and a white blood cell count of 4,450 with a slight relative lymphocytosis of 44%.

The history suggested a diagnosis of homologous serum hepatitis and enquiry was made into the batch number of the plasma which she had received in January. It was found to be No. 5521 and that three other patients in the Victoria General Hospital had received plasma from the same batch. These patients were investigated and are noted below.

CASE 2

Male, aged 52 years, was admitted to hospital on December 31, 1948, with fractured femurs following an automobile accident. On the same day he received 800 c.c. of plasma (batch No. 5521) and the next day 500 c.c. of whole blood. On March 21, urticaria appeared and a few days later he became nauseated and lost his appetite. Jaundice was observed on April 6. Examination showed tenderness below the right costal margin but the liver was not felt. The laboratory reported an elevated serum bilirubin, a negative cephalin cholesterol flocculation, a normal serum albumen and a slightly raised serum globulin (3.50 gm. %).

The diagnosis was considered to be homologous serum hepatitis but confirmation was not forthcoming until discovery of the other cases.

CASE 3

Male, aged 24 years, was operated upon on January 8, for perforated appendix and on the same day received 400 c.c. of plasma, batch No. 5521. The next day he received 500 c.c. whole blood. After the discovery of the other two cases of jaundice his family doctor was contacted, on May 22, and he reported that his patient had only a few days before attended his office complaining of so-far unexplained nausea and vomiting. The doctor saw him that evening and noted a faint icteric tinge. We arranged his admission to hospital where he developed a mild degree of jaundice and slight tenderness below the right costal margin. The liver was not palpable. The laboratory reported an elevated serum bilirubin, a one plus cephalin cholesterol flocculation and normal values for the serum proteins.

The diagnosis was clearly homologous serum hepatitis.

CASE 4

Male, aged 60 years, very seriously ill with a cerebral abscess, received 400 c.c. of plasma (batch No. 5521) on December 18, and again on December 21. He died on December 24 from the cerebral condition and his case is noted here only to complete the series of follow-ups on the recipients of plasma batch No. 5521. It also seems of interest to note that, (although there was not time for hepatitis to develop) at autopsy the liver showed no evidence of disease.

DISCUSSION

It is considered that the first three patients noted above had hepatitis of the homologous serum type. The incubation periods from the administration of the plasma until first symptoms appeared were respectively 120, 80 and 120 days. The clinical and laboratory findings were in keeping and final confirmation was provided by incrimination of a single batch of plasma.

Information obtained from the Red Cross indicates that approximately 250 bottles were produced from the same batch of plasma. Of this large number we have been able to trace only nine bottles apart from the ones used in this hospital. Of the nine, eight were used in other hospitals of this city, but we have not been able to obtain any evidence that jaundice occurred among the recipients. The remaining bottle, along with two bottles of batch No. 5404 was given to a woman patient in Prince Edward Island who developed jaundice 80 days later. The scanty information available about batch No. 5521 makes it impossible for the incidence of homologous serum jaundice to be assessed. However, all of our patients receiving plasma from this batch developed jaundice and this suggests that the plasma was highly icterogenic and that other cases almost certainly occurred.

The incriminated plasma was found to have been obtained from Winnipeg in January, 1945. Since viruses can multiply only in the living cell, the original virus must have existed in the dried plasma for no less than 4 years before exerting its effect on the human body.

In conclusion, it is felt that more cases of homologous serum hepatitis occur than is realized. Proved high incidence rates (in the

vicinity of 4%)[13, 14, 21] in plasma recipients of a disease with an appreciable mortality as well as one requiring lengthy hospitalization and convalescence with concomitant economic features, makes prevention a most important matter. Absolute diagnostic confirmation is not always possible as in the present cases, but careful checking of plasma batches and patient follow-up will aid. Since the disease is not normally notifiable, no official statistics are available. Fortunately, the advent of irradiated plasma will soon probably make the disease from this source of little practical importance but until that time an appreciable morbidity and mortality must be expected.

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A helping of potato has about as much iron as two slices of enriched bread or about as much as half an egg. One medium-sized boiled potato has as much vitamin C as a small glass of tomato juice.

TRAUMATIC ANTERIOR DISLOCATION OF THE HIP*

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TRAUMATIC anterior dislocation of the hip is an uncommon injury. Dislocations of the hip comprise about 2% of all dislocations, and of these, posterior dislocations are seven times more common than anterior. Although there are several reports in the literature on dislocations of the hip, few concern themselves with anterior dislocations. On reviewing the records of the Episcopal Hospital in Philadelphia, Steinke[1] noted two cases of anterior dislocation of the hip in 23,000 surgical cases, 6,000 of these being classified as surgical injuries. Urist[2] reported 14 cases of dislocation of the hip in the U.S. Army during the last war; one of these was an anterior dislocation. Armstrong[12] reported 101 cases of dislocation of hip in the Royal Air Force, June, 1940 to June, 1945.

During the past year two cases of traumatic anterior dislocation of the hip were treated at the Royal Victoria Hospital. These cases are of particular interest inasmuch as in both cases Bigelow's[3] circumduction technique failed to effect reduction. Reduction was accomplished by following the principles laid down by Allis[4] compelling the head of the femur to take a course the reverse of that of dislocation.

CASE 1

This 14-year old boy tripped over a hurdle landing on his left leg. He felt something give in his left hip and was unable to move the leg. On admission to hospital the affected limb was externally rotated and the femoral head could be felt bulging in the left inguinal region just lateral to the femoral artery, the dorsalis pedis and posterior tibial artery pulsations were present. X-ray confirmed the diagnosis of anterior dislocation of the left hip.

Under general anæsthesia with good relaxation, repeated attempts to secure reduction by the circumduction method of Bigelow failed. By applying gentle traction in the line of the body with the limb extended the dislocation was reduced without difficulty.

Following reduction the patient was immobilized in a plaster hip spica for four weeks; then mobilization with non-weight bearing exercises was carried out for eight weeks, followed by return to full activity.

CASE 2

This 26-year old man was seated in the front seat of a car involved in a collision. On admission to hospital the right leg was abducted and externally rotated and the head of the femur could be felt bulging in the inguinal region. Pulsations of the popliteal, dorsalis pedis

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and posterior tibial arteries were absent in this limb, while the pulsations in the femoral artery proximal to the dislocated head of the femur were of increased intensity. The femoral artery was displaced laterally. An area of anæsthesia was present over the antero-medial aspect of the right leg. X-ray examination confirmed the diagnosis of anterior dislocation of the right hip.

Under pentothal anæsthesia repeated attempts to secure reduction by the circumduction method of Bigelow failed. Traction was applied manually with the leg slightly abducted and flexed, and with traction maintained the limb was internally rotated; this manœuvre effected reduction of the dislocation without difficulty.

Following reduction the pulsations returned to the vessels of the leg and sensation returned to the anæsthetic area. The patient was immobilized in a plaster hip spica for four weeks, after which mobilization with non-weight bearing exercises was carried out for eight weeks followed by return to full activity.

Mechanism of anterior dislocation.—The most important factor in the production of anterior dislocations is forcible abduction; forcible external rotation also tends to propel the femoral head forward through the capsule. The position of the head depends upon the force, the positions being pubic, subspinous, obturator, infracotyloid and perineal. Of 16 cases of experimental anterior dislocations produced on cadavers by Pringle,[5] all were produced by abduction and eversion with the joint flexed. The iliofemoral ligament (Y-ligament of Bigelow) is considered to act as a fulcrum in this dislocation, but Pringle also emphasizes the importance of the iliopsoas muscle in this connection.

Complications.—Anterior dislocation is accompanied by rupture of the ligamentum teres, tear of the capsule, and considerable injury to the structures surrounding the joint. The complications of anterior dislocation are the results of trauma to the femoral vessels and nerves, avascular necrosis of the head of the femur, myositis ossificans and traumatic arthritis.

Injuries to the femoral vessels have occurred although these are relatively infrequent. Aneurysm of the femoral artery and fatal hæmorrhage due to rupture of the femoral veins have been reported.[5] Goeringer[6] described a case of anterior dislocation of the hip with absent pulsations in the anterior and posterior tibial arteries where the patient died immediately after reduction due to pulmonary embolism, the probable site of origin of the thrombosis being the femoral vein.

Avascular necrosis of the head of the femur is not infrequent, occurring in 20 to 30% of cases promptly reduced.[7] The extent of the necrosis depends upon the degree of vascular damage at time of accident. The blood supply to the head of the femur is derived from the vessels in the neck, the ligamentum teres and the capsule; there is a poor anastomosis between these sources. The major portion of the blood supply enters the hip at the intertrochanteric attachment of the capsule, and thus a relatively large number of capsular vessels may be ruptured in dislocations. The blood supply from the ligamentum teres is nearly always lost, but this is apparently not the most important factor since Kleinberg[8] reported a case of aseptic necrosis where subsequent exposure of the hip showed a normal ligamentum teres blood supply.

Myositis ossificans may result in cases where reduction is delayed and especially where there is lack of immobilization.

Treatment.—Two classical methods of reduction are described, that of Bigelow and Allis. Bigelow's method is a manipulative reduction; the limb is circumducted, the abducted externally rotated limb being flexed, adducted, internally rotated and finally extended. The method of Allis restores the position of the head of the femur through steps in the reverse order of the displacement. In this method traction is made in the line of the femur with the thigh abducted and flexed, and while traction is maintained the thigh is gently adducted and internally rotated to bring the head over the rim and into the acetabulum; during this last manœuvre an assistant presses against the head of the femur and attempts to guide it into the acetabulum.

During reduction of the dislocation, the sole object is to return the head to its socket along the path it travelled, that is through the original tear in the capsule, with at least possible trauma to soft parts. In this regard the Allis method is preferable to that of Bigelow which is considered somewhat hazardous. After studying dislocations upon cadavers Allis stated;

"I unhesitatingly reaffirm what I have so often remarked, that methods of restoration by means of rotation and circumduction are unphilosophical because they do not compel the head to return by way of exit, and dangerous because they enlarge the torn area and have an unavoidable tendency to force capsule and other foreign material into the socket."[4]

This caution against manipulation has been emphasized by others[8, 9, 10] who felt that gentleness in reduction lessened damage to injured vessels.

The failure of the Bigelow circumduction technique to effect reduction of pubic dislocations has not been particularly emphasized. MacFarlane[11] reported a case where attempted reduction by the Bigelow method failed; he commented on his inability to find a case record noting the difficulties in immediate reduction of these dislocations. In 16 cases of experimental anterior dislocation on the cadaver, Pringle[5] effected easy reduction by inversion in the abducted flexed position. Our recent experience with two cases confirms these observations, inasmuch as the Bigelow circumduction method failed to effect reduction, while the dislocations were readily reduced by causing the head to return to the acetabulum through the path it travelled in its exit.

The post-reduction treatment employed is the maintenance of the limb at rest in a plaster hip spica for three to six weeks then mobilization by non-weight bearing exercises for eight weeks. The immobilization of the affected limb is considered an important factor in promoting the healing of the capsular vessels and in preventing myositis ossificans. Although there is no evidence to suggest that early weight bearing predisposes to avascular necrosis, it is felt that the degenerative process, if it does occur, will be aggravated by this weight bearing. The value of prolonged restriction of weight bearing is difficult to assess since there have been no control studies published on the after treatment of these cases.

SUMMARY

Two cases of traumatic anterior dislocation of the hip are presented. In both cases the circumduction technique of Bigelow failed to effect reduction. Reduction was accomplished by following the principles of Allis, compelling the head of the femur to take a course the reverse of that of dislocation. The mechanism, complications and after treatment of traumatic anterior dislocations are discussed.

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THE MANAGEMENT OF MALIGNANCY OF THE MAXILLARY SINUS*

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THE effective treatment of antral malignancy depends on a combination of early diagnosis, adequate surgery, combined with intracavitary irradiation and fractional external roentgen ray therapy. Great importance is attached to regular and frequent follow-up care and immediate therapeutic measures are instituted whenever indicated by these postoperative examinations.

The system described here is similar, in many respects, to the method used by New,[1, 2] who reported 36 to 50% five-year cure rates, employing combinations of surgery, intracavitary irradiation and external deep x-ray therapy. In his series of 97 patients, 11 lost one of their eyes during the course of treatment. In our group of ten patients, one required orbital exenteration. It is emphasized that, whenever this procedure is indicated clinically, no temporizing measures can be entertained if reasonable hope for the patient's life is to be expected.

In a recent survey at the University of Illinois Tumour Clinic, it was noted that, in the past fifteen years, patients with maxillary sinus cancer presented themselves ten times more often than did patients with malignancies involving all the other paranasal sinuses combined. Furthermore, in our group of ten antral neoplasms, five occurred in each sex, eight in white and two in coloured people. Seven involved the left side, four the right. One patient suffered a bilateral involvement—the left maxillary sinus developing a transitional cell carcinoma two years after he had apparently been successfully treated for a squamous cell carcinoma on the right side. We do not claim a five-year cure as yet, but clinically, at the present time at least, the right antrum is free from neoplasm. The lesion on the left side seems to be completely dissociated and independent from that which had once involved the right antrum.

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The youngest patient was 12 years old, the eldest 65 years. Three, on admission, demonstrated neck node involvement, a fourth developed cervical node metastasis shortly after treatment was started. All our patients, at operation, displayed soft tissue involvement of the postero-superior aspect of the antrum. With regard to the duration of the disease prior to the beginning of treatment, our case histories date back to 18 months or less before the patient presented himself for systematic therapy. From a histopathological standpoint, six were squamous cell carcinomas of varying degrees of immaturity and two were transitional cell carcinomas. One cylindrical cell carcinoma, one basal cell carcinoma and one melanoma were also noted.

SYMPTOMATOLOGY

The symptoms are ever-changing and dependent upon the rate of growth of the tumour, as well as on its site of origin and location. The presence or absence of bone destruction along with the actual volume of the mass itself also plays a part in this regard. On the other hand, symptoms alone are of little aid in estimating the extent of the malignancy.

Unilateral nasal discharge frequently results from the concomitant infection of the neoplasm as well as from the secondary obstructive changes that usually occur in the adjacent frontal, ethmoid and sphenoid sinuses. This discharge is frequently associated with bleeding from the thin-walled, newly formed blood vessels which are produced during the development of the neoplasm.

Neuralgia, anæsthesia and paræsthesia may occur, usually from pressure or erosion by the tumour mass on branches of the trigeminal nerve. This feature may also produce "referred pains" to the temporomandibular joint. In one instance, at a different hospital (in our 12 year old patient) this led to surgical exploration of the joint to determine the etiology of pain in this region. The maxillary sinus was not investigated at the time. When first seen in our clinic a year later, the patient displayed a far advanced cancer with bilateral cervical node involvement. He succumbed about six months later—one of our three fatalities.

The most constant complaint seems to be unilateral persistent nasal obstruction. When this develops insidiously in a patient past forty years of age, especially where allergy and trauma can be discounted, then the examining physician should strongly consider the possibility of a maxillary sinus malignancy.

Frontal headache also occurs not infrequently. Furthermore, metastatic lesions such as one may find in patients with neck node involvement and especially those with cerebral metastasis must be kept in the limelight when evaluating the complete symptom complex in any one patient.

For example, convulsions and personality changes may occur as a result of cerebral involvement. In this situation, the patient seems to be almost euphoric. "Depressed states" are not common under these circumstances. (Two of our three fatalities demonstrated euphoria as a terminal symptom. They seemed to lack insight into their plight.)

One must entertain the possibility that cancer in this location produces the same clinico-psychiatric end result just as if the patient had undergone prefrontal lobe surgery of the type performed at present for certain psychiatric "depressed states". This termination is not infrequent for patients whose neoplasm originates in the postero-superior and medial aspect of the maxillary sinus.[4] Cancers in this area usually spread by direct extension to the ethmoid labyrinth and, through the cribiform plate, into the cranial cavity, giving rise to frontal lobe abscess or meningitis.

In order to describe more specifically the varied symptoms associated with this disease, four separate groups of inter-related findings are suggested:

Group 1.—Symptoms referable to the nose, such as unilateral polyps, nasal discharge, insidious but progressive nasal obstruction, nasal hæmorrhage, parosmia and fetor are all included under this nasal grouping.

Group 2.—Symptoms referable to the buccal cavity such as paræsthesia or dental pain of unknown origin involving the upper jaw, gingival ulcers which persist and progress in spite of local treatment and fungating tumours arising in this area, fall into this group.

Group 3.—Facial symptoms form a class by themselves. Here one finds swellings over the cheek or in the area of the malar bone. Fixation of the skin to the underlying tissues or even frank ulceration with severe facial distortion might also be seen in a far advanced lesion in this region.

Group 4.—Orbital symptoms are characterized occasionally by the insidious onset of excessive unilateral "tearing". This increased lachrymation usually results from infiltration by the tumour mass into the lateral wall of the nose, where it can involve and obstruct the nasolachrymal duct. Ectropion of the lower lid with widening of the orbital fissure, as well as proptosis and limitation of orbital movements are all included in this category of symptoms.

Seven of our patients were listed in the nasal group, five in the buccal group, five in the facial group and four in the orbital group. These figures imply, and rightly so, that all our patients revealed a multiplicity of symptoms which involved two or more of the above groupings and which explains the apparent statistical discrepancy. For a more exact clinical description, it might be advisable to denote maxillary sinus neoplasms by the above method of symptom groupings that may characterize any specific case. For example, one might employ the term "nasal-buccal" carcinoma of the right maxillary sinus or "buccal-facial-orbital" involvement of the right antrum and so on.

With regard to the problem of nasal polyps in malignancy of the antrum, we offer the following quotation: "large masses of polyps which protrude from the nares and even cause external deformity are frequently revealed by biopsy to be benign superficially, but continued studies of the pedicle disclose the underlying factor of malignancy".[5]

It has been our experience that biopsies do not always produce a conclusive diagnosis. They should be repeated whenever there is the slightest clinical suspicion of malignancy. It is noteworthy that nasal polyps, associated with neoplasms, are usually unilateral and occur most commonly when the cancer involves the postero-superior region of the sinus. Polyps do not occur as frequently when the neoplasm is confined to the inferior aspect of the sinus.

One cannot emphasize too much the desirability for the earliest symptoms of this disease to be properly interpreted, for it is by these vague but all important early symptoms which develop soon after the onset of the pathologic process, that we can hope to attain the early diagnosis which is so vital if successful treatment is expected.

In other words, dental pain of unknown origin, neuralgias about the face whose cause is undetermined, insidious unilateral nasal bleeding, persistent unilateral nasal discharge (and frequently this is associated with nasal obstruction which develops without apparent cause), especially in a person of "cancer age", all of these should be considered indicative of malignancy until proved otherwise. It is important for the dentist or diagnostician to focus his attention on the possibility of these early complaints being associated with cancer in this area. Otherwise, this may result in treatment being delayed, which in turn would lead to a more dismal prospect for the patient. In this regard, tumour cell studies (Papanicolaou) of nasal secretions or sinus washings may be of particular value.

PATHOLOGY

Neoplasms involving the maxillary sinus are closely associated with neoplastic changes in the ethmoid sinus and the lateral nasal wall. The patient, when he first arrives for investigation, usually does so when the disease process has already progressed to such an extent that the exact site of origin cannot be determined. Clinically, this is not of too great significance, since the ethmoid sinus ordinarily forms part of the medial wall of the maxillary sinus. The treatment is the same in any event, since both these areas have a common lymph channel system which extends to the retropharyngeal and cervical lymph nodes; although involvement of retropharyngeal nodes was not demonstrated, clinically, in our series of patients.

It seems important from the viewpoint of prognosis to divide the maxillary sinus into upper and lower regions by means of Ohngren's "malignancy line".[4] The extension of neoplasms from the superior aspect differs radically from those in the inferior area. The first usually metastasizes rapidly by direct extension to the cribiform plate, and through it to the frontal lobe; the second frequently spreads by embolic phenoma to the cervical nodes and then comparatively late in the disease process.

In considering cancers of the maxillary sinus, we include the following areas of involvement: (*a*) those lesions confined to the maxillary sinus or invading the orbit, pterygo-maxillary or infratemporal fossa; (*b*) those neoplasms originating in the alveolar process; (*c*) lesions involving the lateral nasal wall and ethmoid labyrinth with or without extension to the orbit; (*d*) neoplasms of the hard palate (floor of the maxillary sinus). All other tumours, whether they arise in the buccal cavity or from the nasal septum, as well as cutaneous lesions of a neoplastic nature which invade the sinus from without, are excluded.

Histopathologically, a great deal of controversy still exists as to just what classification is best for maxillary sinus cancers. A useful and practical arrangement is offered by Lederer,[5] who divides them in the following manner:

I. *Epithelial types.*

(*a*) Hornifying squamous cell carcinoma. (*b*) Non-hornifying squamous cell carcinoma. (*c*) Transitional cell carcinoma. (*d*) Cylindrical cell carcinoma. (*e*) Basal cell carcinoma. (*f*) Lymphoepithelioma.

II. *Connective tissue types (sarcomata).*

(*a*) Spindle cell sarcoma. (*b*) Osteoblastic sarcoma. (*c*) Fibrosarcoma. (*d*) Myxosarcoma. (*e*) Round cell sarcoma. (*f*) Polymorphous sarcoma. (*g*) Melanoma (sarcoma?).

III. *Mixed type, or salivary glandular forms.*

This group is a most controversial one, due to the relative confusion prevailing regarding "malignant mixed tumours".

Sometimes these latter types, (Group III), are classified as epitheliomas; at other times they are designated as connective-tissue growths. On still other occasions they are described as basal cell carcinoma, colloid cancer or endothelial cylindromata. We are inclined to accept the opinion of those authorities who assemble this entire group of varied malignancies under one heading, describing them as "salivary gland tumours". Pathologists in general do not accept this terminology but, until the problem is clarified, we feel it is not contraindicated to use this nomenclature.

With regard to prognosis in any given situation, the emphasis should be placed on the site of origin, the location, the cell type, the maturity of the cancer and whether or not cervical nodes are present. If such nodes are palpated or otherwise demonstrated to be present, it is of value to determine whether or not they are fixed. The surgeon must take into regard all these practical and highly important findings when considering treatment. It is our feeling that whether the lesion is an epithelial or sarcomatous or "glandular" one is merely of academic interest and should not radically influence the therapeutic management of any given case.

TREATMENT

All our patients underwent preliminary external carotid ligation. Then, immediately following, and during the same operative stage, a sublabial entrance was made into the maxillary sinus. In one instance a Mouré incision was attempted, later followed by the typical sublabial approach.

The neoplasm was then removed or destroyed as completely as possible with the aid of electro surgery and electro-fulguration. In order to provide wide exposure of the antrum, a large portion of the palatine process of the involved maxilla was then removed. This facilitated subsequent postoperative examinations and treatments, and also provided a space for application of the required intracavitary radium or deep x-ray therapy, which usually was administered following operation. Radium was employed in various forms, preferable as a plaque enmeshed in vaseline gauze. Usually between 1,500 and 3,000 mgm. hours were administered to the operative site. Radon seeds were also used whenever indicated, either into the region of the infratemporal fossa or into any fixed cancerous neck nodes complicating the situation.

Fractional dose technique of external irradiation was employed in association with the above intra-cavitary measures. Between four to six thousand R were administered, usually in divided daily doses of two hundred R to three hundred R.

Cosmetic factors are never considered at this stage. This feature becomes significant only when the disease process has been completely eradicated. Then only may repair operations be contemplated. In this connection it is our belief that prosthetic appliances are usually a better solution. Furthermore, when preparing them, one must give careful thought to factors of speech and mastication.

One cannot over-emphasize that it is only by employing a combination of all methods of treatment and not by any single form of therapy alone, that success in any given case can be expected. Surgery, radium, or deep x-ray when used alone will usually lead to failure, whereas all these forms of therapy, when employed judiciously and in indicated combinations with each other, may lead to better five-year cure rates. Certainly, the statistical results of "combined treatment" indicate their employment.

Several of our patients revealed local recurrences or evidence of residual malignant tissue and even neck node metastasis following surgery. These findings were observed during the stage of regular, frequent and careful follow-up study, which one felt was a most vital phase in the treatment of these conditions.

Whenever evidence of local residuum or reactivity at the primary site was noted, surgery, electro-fulguration and further irradiation was again employed without delay, depending on

the individual requirements of the patient. In this fashion, by repeated observations post-operatively, aided by a large defect in the floor of the sinus which permitted adequate visualization, we were better able to establish the presence of reactivity at its earliest moment and to deal with the situation swiftly.

The question of when to employ radical neck dissection or deep x-ray therapy or installation of radon seeds into neoplastic nodes is always a difficult one. According to Willis,[6] so long as there is evidence of activity at the primary site, for example the antrum, then neck nodes to which the neoplasms would usually metastasize should be left intact in order to act as a barrier or road block against the possibility of a generalized spread of the neoplastic disease process to collateral areas, which might be less accessible to diagnosis and further treatment, than is the region of the anterior neck triangle.

If an enlarged neck node does develop whilst activity at the primary site still exists, it would be essential that we do not dissect this node in order to obtain a confirmatory biopsy, since, in so doing, the surgery employed would interfere with the regular lymphatic channels of the neck. This would create a haphazard lymphatic circulation, which might conduct metastatic emboli to inaccessible areas rather than to the desired and readily recognizable nodal barriers in the neck. Thus, aspiration biopsies are indicated in the above situation.

Furthermore, if neck nodes should develop, whilst activity still existed in the local area, radon seeds could be instilled into the neck nodes in an attempt to enhance the road blocking features which these nodes seem to possess, while the local residuum or recurrence is undergoing further treatment. (Occasionally, neck nodes may actually become "fixed" during the course of the disease process; here radon seeds by direct dissection and visualization could be instilled. Furthermore, deep x-ray therapy is then also indicated when neck nodes are thus fixed to the deep tissues.) On the other hand, if the primary growth has been completely excised and movable neck nodes are demonstrated, then a radical neck dissection followed by deep x-ray therapy is the treatment of choice.

CASE REPORT

A white male, 51 years old, presented himself to the clinic with the following features: left nasal obstruction, nasal polyps with swelling and ulceration in the left upper gum margin of the mouth. These had appeared eight weeks before admission on February 2, 1947. The swelling in his mouth enlarged rapidly and very soon obstructed the buccal cavity completely. There was a loss of twenty pounds in weight.

A large tumour hung down into the mouth pushing the tongue inferiorly before it. The mass seemed to arise in the left maxillary sinus and extended through the palatine process of the left maxillary bone. It involved both the left and right palatine bones posteriorly. The tumour was rather pale gray in appearance, with areas of pinkish discoloration irregularly scattered throughout. It was collagenous-like and was non-tender to touch. By its bulk, it interfered with movements of the tongue which led to impairment in swallowing and speech function (Fig. 1). Biopsy of the mass revealed it to be an anaplastic carcinoma of the left maxillary sinus. X-ray studies revealed "an area of homogeneous density over the left antrum, ethmoid and sphenoid sinuses. The lateral and inferior walls of the left antrum were involved in a destructive process." There were no palpale neck nodes at the time of admission.

On February 5, the left external carotid artery was ligated under local anæsthesia. A large portion of the mass was excised locally to better visualize the posterior confines of the lesion as well as to alleviate the nutritional problem resulting from the buccal obstruction. Fig. 2 reveals a "prophylactic ligature" around the common carotid artery, left *in situ* for ten days post-operatively as a precautionary measure.

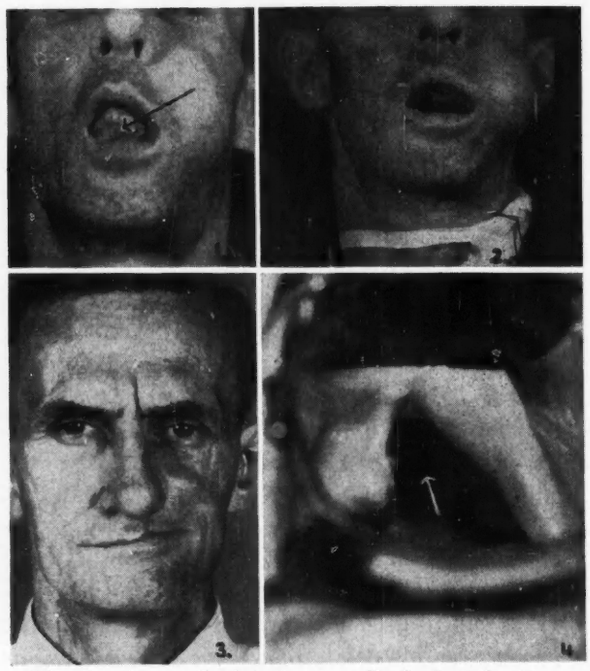

Fig. 1.—Arrow depicts tumour displacing the tongue from view. **Fig. 2.**—Note black silk "delayed suture" around the left common carotid artery. The left external carotid artery was permanently tied off. Note also, the rapidly regrowing mass in the roof of the mouth, ten days after the original excision. **Fig. 3.**—The patient, two years after treatment. He has gained over thirty pounds in weight. Note the bilateral healed scars where the external carotid artery had been ligated on each side. **Fig. 4.**—Arrow depicts the permanent defect on the left side of the roof of the mouth.

In view of the highly anaplastic nature of the tumour, deep x-radiation locally was prescribed. Between February 12 and February 28, 5,300 R. was administered through the routine local portals by the fractional daily dose technique.

On March 1, the right external carotid artery was ligated to overcome the possibility of collateral circulatory channels becoming a hæmorrhagic threat. Then a

radical resection of the left maxillary sinus was performed with excision of all accessible tumour tissue. A modified Mouré approach was employed. The neoplasm was found to have penetrated into the area of the infratemporal fossa. Twenty-five radon seeds (1.5 mc. each) were implanted into this region.

On March 13, tumour tissue was again demonstrated in the operative area and a revision procedure was performed, employing a sublabial approach. Electrosurgical excision of tumour tissue remnants, as well as complete electro-fulguration of the entire operative surface was carried out. Shortly afterwards, deep x-ray therapy by the fractional dose technique was again resorted to through the usual portals.

On March 25, seven weeks after the original surgery, palpable neck nodes were demonstrated in the area of the left anterior triangle, deep to the sternomastoid muscle in the region of the great vessels. Aspiration biopsy from these neck nodes revealed metastatic carcinoma. On April 5, under local anæsthesia, a modified neck dissection was performed to expose a number of large cervical nodes, which were matted together and which seemed to be adherent to the underlying great vessels of the neck. Twenty-five radon seeds were inserted into these nodes under direct vision and with the aid of direct palpation. In this fashion, 2,500 mc. hours were administered.

The patient then made an uneventful postoperative recovery, and is now being observed at regular intervals at the tumour clinic. When last heard from, on Christmas Day, 1948, he seemed to be progressing favourably in that he has had no evidence of either local re-growth or peripheral spread to the neck or elsewhere. He has gained over thirty pounds in weight and is back at work. The neck nodes seem to have disappeared completely.

A rubber sponge, which originally was employed postoperatively to fill the cavity in the maxillary sinus for eating and speaking purposes, has now been replaced by a dental prosthesis. This provides the patient with facilities for speaking and eating, which are a great help in maintaining his morale and nutrition and, at the same time, allows the surgeon to carefully inspect the operative site for local recurrence at regular intervals.

SUMMARY AND CONCLUSIONS

1. The case history of an adult male with an anaplastic carcinoma of the left maxillary sinus is presented, demonstrating the importance of employing every therapeutic measure available, and as often as indicated by the clinical condition of the patient.

2. It is interesting that intense deep x-ray treatment to the lesion preoperatively did not seem to influence the neoplastic progression in spite of the fact that the tumour was very anaplastic. Possibly the fact that the patient had been treated for lues years before and was now a serofast positive case might be of significance.

3. Neck nodes developed after surgical and radio-therapeutic measures had been administered. Furthermore, the diagnosis of involvement of these nodes was obtained by aspiration biopsy. Radon seed implantation seemed to arrest and actually overcome the metastatic process in this area.

4. In this patient, as well as in any other afflicted with cancer, there never was and there should never be any question of using radium, surgery, or deep x-ray therapy alone. It is noteworthy that all therapeutic measures were employed in conjunction with one another. We consider the result favourable so far, since the lesion had already involved the posterior wall of the sinus at the time the patient first came under treatment. It is still premature to claim a cure, since only two years have elapsed, but the patient at least is now comfortable and shows no signs, at present, of re-activity in any area.

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METABOLIC VARIATIONS IN SCHIZOPHRENIA*

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THE literature dealing with the biochemical aspects of mental diseases is still in a quite chaotic state. While most of the intermediate metabolisms have already been dealt with, the results have been confusing and of little help in differentiating the various types of psychoses. As suggested by McFarland and Goldstein,[1] numerous uncontrolled factors might be responsible for this, such as faulty diagnosis and inadequate statistical treatment of the results.

Nevertheless there are general trends which may justify further investigation. Of these, the lipid metabolism is perhaps the most striking.[1]

Blood cholesterol levels have been widely used on the basis that they are closely parallel to those of other lipoids in many conditions.[2, 3]

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Early research tended to classify mental groups according to their hypo- or hyper-cholesterolæmia. Unfortunately, this hypothesis only led to more confusing results. However authors quite agreed to a generally high blood cholesterol content in manic depressive psychosis, and to a low content in schizophrenia.[2]

It is only recently that attention has been paid to the fact that mentally deficient subjects show a greater *variability,* particularly in blood constituents, rather than a mere deviation from normal levels.[4] While most authors agree that cholesterol and other lipids levels are quite stable in normal individuals, recent studies, especially those of Morrison *et al.*,[5] suggest that such levels are subject to wide variations in the same individual at different periods and under different conditions. The same authors suggest that a variation of over 15% might be the evidence of a latent illness.

We undertook blood total cholesterol, cholesterol esters and free cholesterol (obtained by difference) determinations on a series of definitely diagnosed schizophrenic patients and on mentally normal subjects. Up to this date, about 1,000 determinations have been done on 33 subjects, during periods varying from four to twelve weeks. Graphs of the cholesterol levels are quite revealing.

1. Constancy of all cholesterol levels is generally reaffirmed in normal subjects (Figs. 1 and 2). Intentionally we have chosen two of the

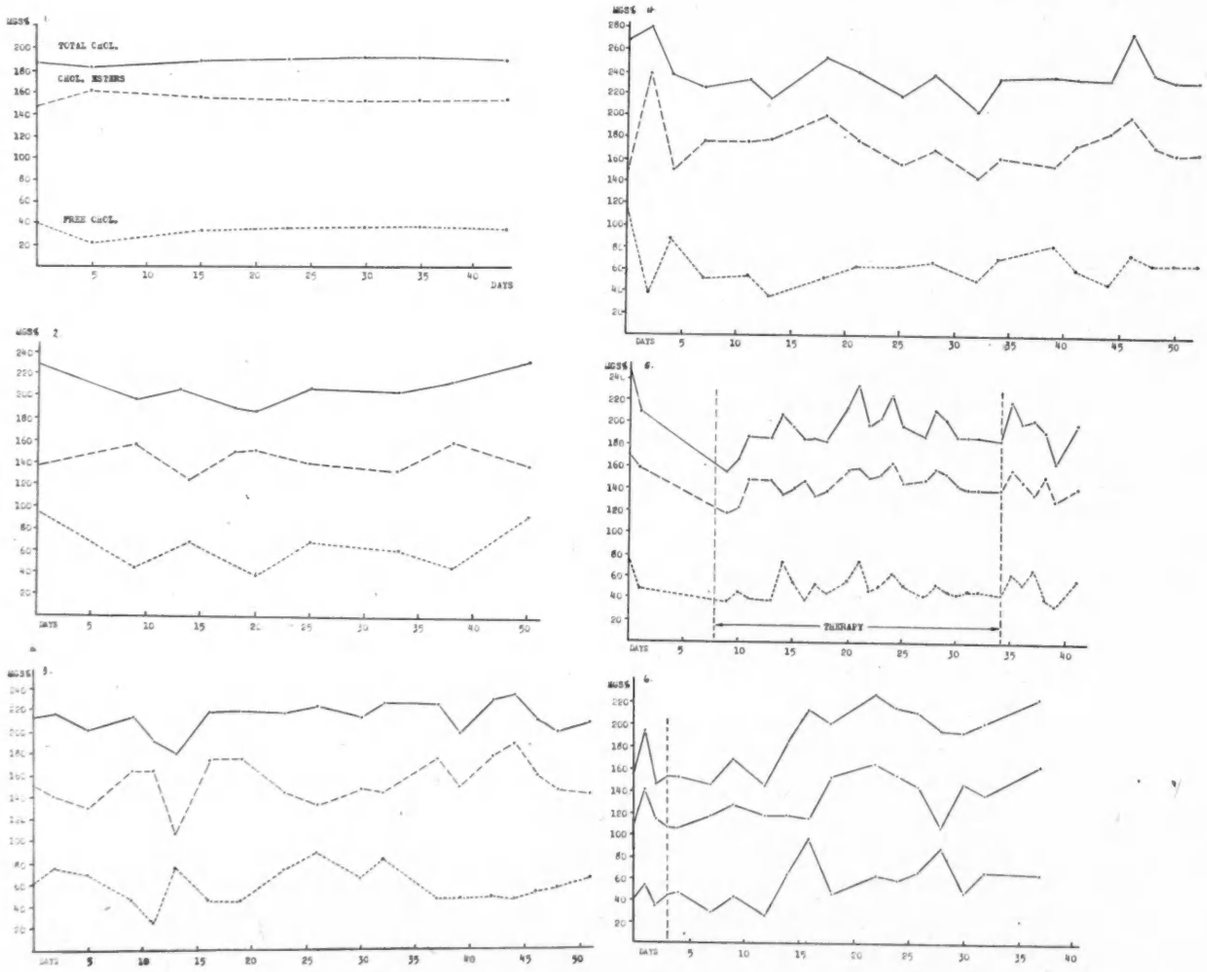

Fig. 1.—Serum cholesterol levels in a normal control (Obs. 8). In this graph and the following, the top curve represents total cholesterol level; the middle curve, cholesterol esters level; and the bottom curve, free cholesterol level. **Fig. 2.**—Serum cholesterol levels in a normal control (Obs. 2). **Fig. 3.**—Serum cholesterol levels in a schizophrenic patient (Obs. 1). **Fig. 4.**—Serum cholesterol levels in a schizophrenic patient (Obs. 2). **Fig. 5.**—Serum cholesterol levels in insulin shock therapy (Obs. 11). Clinical data: diagnosis: schizophrenia (paranoid); marked improvement at end of treatment; stationary state two weeks after treatment. **Fig. 6.**—Serum cholesterol levels in insulin shock therapy (Obs. 18). Clinical data: diagnosis: schizophrenia (paranoid); slight improvement from 9th to 20th day; poor prognosis since 30th day. Note parallelism between top and bottom curves from 7th to 17th day and between top and middle curves from 31st to 37th day.

graphs that show the least and the most variations in normal controls.

2. It is also interesting to note the striking parallelism between *total* cholesterol and *free* cholesterol levels.

3. Greater variability is observed in schizophrenic patients, as illustrated in Figs. 3 and 4.

4. Schizophrenic curves also show marked peaks which were never observed in normal ones.

5. But the most striking observation is that, in 9 of 10 of the schizophrenic individuals, there is a definite parallelism or correlation between *total* cholesterol and cholesterol *esters* levels.

Table I shows a comparison of results between the schizophrenic and the normal groups.

1. The percentage of variation from the mean cholesterol levels is higher in the schizophrenic group, as it was already evident in the corresponding curves. The difference between the means of total cholesterol variations, although small, is significant, according to statistical computations ($t = 2.30$). The difference between the means of cholesterol esters variations is even more significant, the ratio being approximately 2 to 1.

2. Calculation of the correlation coefficient, to illustrate the parallelism between the cholesterol levels, shows a definite correlation in the schizophrenic group between total cholesterol and cholesterol esters.

3. It is also interesting to observe that this correlation coefficient is nearly identical for every schizophrenic, regardless of their respective cholesterol levels. For instance, this coefficient is equal to 0.60 in both cases shown in Figs. 3 and 4. This similarity was never found in normal controls.

We might presume by these figures that we have been dealing with a rather homogeneous biological, if not mental, group. The only discordant figures (Obs. 9) suggested a revision of the case. Although it is too early yet to draw any conclusions, it seems from the latest clinical observations that these figures belong to a non-typical schizophrenic.

While an immediate explanation could not be found for this peculiar behaviour of free cholesterol and cholesterol esters, we undertook another series of determinations on a group of schizophrenic patients who were awaiting electro and insulin shock therapy. Randall and Jellinak[6] have already observed that insulin therapy causes marked changes in the lipid levels of schizophrenic individuals. This part of our work is still at a preliminary stage. However the agreement between the cholesterol graphs and the clinical observations seems to justify further investigation. Figs. 5 and 6 show peculiar relations between the sudden changes in the cholesterol levels and the clinical data.

TABLE I.

Obs.	*Mean total cholesterol*	*Standard error*	*Variation percentage*	*Mean chol. esters*	*Standard error*	*Variation percentage*	*Correlation coefficient*
			I. SCHIZOPHRENIC GROUP				
1	211.0	3.079	6.53	152.5	4.446	13.04	0.60
2	238.0	4.235	7.95	173.5	4.970	12.81	0.60
3	204.5	3.992	8.51	149.0	4.281	12.52	0.595
4	119.0	2.610	8.18	73.0	3.678	18.84	0.66
5	163.0	2.825	7.15	116.5	4.157	14.71	0.64
6	164.0	2.980	8.13	112.0	3.763	15.03	0.66
7	175.0	3.162	7.45	120.0	4.300	14.77	0.66
8	154.0	2.977	7.49	100.0	3.537	13.70	0.60
9	161.0	2.189	6.23	109.0	2.479	10.42	0.345
10	172.0	2.989	7.77	124.0	2.985	10.77	0.67
			Mean: 7.54			Mean: 13.66	
			II. NORMAL GROUP				
1	204.0	3.673	5.40	150.0	3.496	6.99	0.25
2	207.0	5.536	8.02	145.0	4.030	8.34	−0.23
3	266.0	6.360	7.93	190.0	5.063	8.84	0.36
4	225.5	4.006	4.35	165.5	3.339	4.94	−0.43
5	183.0	3.757	6.49	133.0	4.490	10.68	0.44
6	276.5	4.420	4.23	200.5	4.964	6.55	0.08
7	188.5	4.332	7.27	143.0	3.516	7.78	0.27
8	191.0	3.282	4.54	157.5	3.328	5.83	0.20
			Mean: 6.02			Mean: 7.49	

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RÉSUMÉ

Il semble de plus en plus évident que le métabolisme des lipides soit celui qui est le plus affecté au cours des maladies mentales. Ce n'est que récemment que l'attention des chercheurs a été attirée par le fait que ce n'est pas tant l'*écart* de la normale que leur grande *variabilité* qui caractérise les constituants biochimiques des sujets anormaux.

Nous avons choisi le cholestérol comme indice du métabolisme des lipides, suivant l'hypothèse généralement admise que sa teneur est étroitement parallèle à celles des autres lipides. Nous avons effectué la détermination du cholestérol total, estérifié et libre du sérum sur un groupe de sujets normaux et sur un groupe de déments précoces dont le diagnostic a été confirmé à plusieurs reprises. A date, environ 1,000 déterminations ont été faites sur sujets, durant des périodes variant de 4 à 12 semaines.

PRINCIPALES CONSTATATIONS

La stabilité de tous les niveaux cholestérolémiques est de nouveau mise en évidence chez les sujets normaux. La plus grande variabilité des déments précoces s'illustre par un pourcentage plus élevé dans la variation du cholestérol total. La différence entre les sujets normaux et les déments précoces, bien que faible, est statistiquement significative. Les différences dans le taux de variation du cholestérol estérifié sont encore plus significatives, la moyenne passant du simple au double. Il existe une corrélation *constante* entre le cholestérol total et le cholestérol estérifié, chez les D. P. Cette corrélation est illustrée par un parallélisme évident entre les courbes correspondantes sur les graphiques. Cette corrélation ne se rencontre pas chez les sujets normaux (mécanisme d'adaptation?).

Nous avons ensuite entrepris une autre série de déterminations chez des sujets soumis à l'insulinothérapie et à l'électro-choc. Bien que ce travail en soit encore à un stage préliminaire, il semble exister une concordance entre les changements subits des taux de cholestérol et les observations cliniques. Par exemple, la corrélation entre le cholestérol total et le cholestérol estérifié disparait avec l'amélioration du sujet.

SARCOMA OF THE BREAST

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THE object of this paper is to present a review of sarcomata of the breast received at the Pathological Institute in Halifax during the 17-year period from January 1, 1932 to December 31, 1948, and to present four fairly typical case reports. The specimens have come from all parts of the Province of Nova Scotia and from several different surgeons, two of whom are deceased; consequently, the treatment has not been standardized and available information regarding some of the patients is rather scanty.

Sarcoma of the breast occurs with relative infrequency while carcinoma of the breast is very common. During this 17-year period, we received 1,378 malignant breast tumours and of those, 12 were of sarcomatous nature, thus accounting for only 0.87% of all breast malignancies. One breast, containing a large, bulky myxo-chondrosarcoma from a Newfoundland dog is not included in this review. Ten, or 83.3%, occurred in females and 2, or 16.6%, occurred in males, making a predominance of five to one in females. Eight of the patients were between 49 and 65 years of age and three were over 70, being 74, 80, and 83 years old respectively. There was no predominance of sarcoma occurring in either right or left breast.

The clinical history varied within rather narrow limits, the one outstanding and fairly commonplace feature being the remarkable rapidity of growth, either in the primary growth or in the local recurrence. In one instance (Case 2), a recurrent nodule of one-half inch in diameter enlarged to a tumour five inches in diameter in the short period of one week. The size of the tumours varied from one-half inch to five inches in diameter, but most specimens were about three inches in diameter. The duration of the known presence of the tumour at the time of the first medical examination was less than three months in the majority of instances but one tumour was found during a routine physical examination and another had been present for years. It is usually stated that pain is uncommon. This state-

ment has been true in this series as far as the original growth has been concerned, but three of the patients complained of pain in the local recurrences.

PATHOLOGICAL CONSIDERATIONS

Two distinct types of connective tissue are found in the breast, the so-called "specialized pale connective tissue" which surrounds the ducts and acini to form lobules, and the general connective tissue stroma which separates the individual lobules. Hyperplasia of both the specialized periacinar connective tissue and the epithelial elements of the acini and ducts gives rise to the familiar condition known as lobular hyperplasia, which may be localized or diffuse, and depending on the degree of epithelial proliferation, either cystic or non-cystic. Differentiated from lobular hyperplasia is the fibroadenoma, which is an extremely localized overgrowth of the secretory mammary epithelium and the periacinar connective tissue to form a nodule which pushes the fibrous tissue before it to form a variable amount of capsule. The chief constituent of hyperplasia in a fibroadenoma is the specialized connective tissue and the usual result is the intracanalicular type, where the duct walls are invaginated and distorted by the sub-epithelial connective tissue. A localized hyperplasia of pericanalicular and periacinar connective tissue results in a pericanalicular fibroadenoma.

Sarcomatous degeneration or transformation of a tumour which has originated in the periacinar or pericanalicular connective tissue, or a sarcoma which develops in this specialized connective tissue, strictly speaking, is the only "breast" sarcoma; however, there are constituents of the breast other than those directly related to mammary function, and it has been customary to include sarcomata originating in these tissues as breast sarcomata. In this group may be placed such tumours as neurofibrosarcoma, liposarcoma, melanotic sarcoma, angiosarcoma and myosarcoma. Chondrosarcoma may also be found.

Boyd[1] states that the most common type of breast sarcoma is the adenosarcoma and that it usually develops in an intracanalicular fibroadenoma which has been present for many years. In a series of 9 breast sarcomata collected over a period of 14 years at the Lahey Clinic[2] six were of this type. Adair and Herrmann[3] report 9 adenofibrosarcomata in a series of 100 cases treated by radical mastectomy, and in the blocks of tissue examined in our series, acinar or duct tissue was found in relation to the sarcoma in only 3 cases (Table I, Nos. 1, 5, and 12). Six of our series were of the spindle-cell type of fibrosarcoma, five of which showed some degree of myxomatous degeneration. One of these six developed in a benign fibromyxoma which contained a pea-sized calcified area which, presumably, was a calcified area of traumatic fat necrosis, and the other five arose either *de novo* or in a simple fibroma. Two were neurofibrosarcomata, one of which developed in a molluscum fibrosum in a 65-year old man who had Von Recklinghausen's disease for many years, and the other occurred in a neurofibroma of the breast of a 54-year old woman. The only malignant lymphoblastoma (round cell sarcoma) occurred in a man's breast and grew to the size of an orange in one month, while the one chondrosarcoma developed in relation to a solitary cyst (localized cystic lobular hyperplasia) in a woman of 74 years of age (Case 1).

TREATMENT AND RESULTS

Of the 6 fibrosarcomata, one is untraced, and one, treated by radical mastectomy alone, is alive with no recurrence at 6 months. Three others were treated by simple mastectomy without radiation and of these, one died in 7 months from other causes, one died about one year later with symptoms of general senility, and the other developed a local recurrence in 6 weeks and died 14 months after mastectomy. The sixth was treated by simple mastectomy, several resections of local recurrences and two courses of radiation but now, 26 months following the first operation, the patient has a massive local recurrence and pulmonary metastases. Of the two adenosarcomata, the one treated by simple mastectomy died in four months with a local recurrence and possible pulmonary metastases, while the other, treated by radical mastectomy without radiation, is alive 6 years and 2 months later with no signs of recurrence. The 65-year old man with a neurofibrosarcoma had a local excision of the primary growth, and two excisions of local recurrences together with 5 courses of radiation which definitely held the growth in check, but 5 years and 8 months later, he has again a large local re-

currence. The 54-year old woman with a neurofibrosarcoma had a simple wide resection of the tumour and is alive and well twelve years later with no recurrence. The patient with the malignant lymphoblastoma had axillary node involvement at the time of the biopsy of the mammary mass and was treated with a total dosage of 3,000 R's at 200 K.V. over a period of 10 days but died in four weeks. This case probably was not primarily a breast lesion and, therefore, it is doubtful whether or not it should be included in this series. The 74-year old woman whose breast contained a chondrosarcoma was treated by simple mastectomy, followed by removal of the pectoral muscles and axillary nodes 4 weeks later, and then by radiation therapy to 4 ports with a total dosage of 2,700 R's to each port. She died within 4 months with massive local recurrence and a persistent cough, probably due to pulmonary metastases.

CASE 1

Mrs. I.B., a 74-year old white woman, consulted her doctor in the latter part of January, 1948, complaining of a mass in the right breast. It was known to have been present as a pea-sized tumour for two and one-half years, but over a period of eight weeks, it had enlarged very rapidly. There was no pain, nipple discharge, eczema or other local complaint. No history of trauma to the breast could be remembered and there was no known family history of malignancy.

Physical examination revealed a small, thin, oldish lady in no apparent distress. There were no abnormal clinical findings in the skin, head, neck, lungs, abdomen, extremities or central nervous system. The right breast was atrophic and pendulous with a very small pedicle-

TABLE I.

SUMMARY OF 12 CASES OF SARCOMA OF THE BREAST

Name	*Sex and age*	*Location*	*Duration of tumour*	*Diameter (inches)*	*Type*	*Origin*	*Treatment operative*	*Radiation*	*Follow-up*
J.R.	F. 49	Left	3 months	3	Adenofibrosarcoma	Papillary cystadenoma	Palliative local excision	Nil	Local recurrence within 3 months. Died in 4 months.
Case 2 E.D.	F. 55	Left	2 to 3 months	2½	Fibromyxosarcoma	Traumatic fat necrosis and fibromyxoma	1. Biopsy. 2. Simple mastectomy. 3. Excision of local recurrence 6 times	2 courses	1. Local recurrence in 4 months. 2. Alive 26 months later with massive local recurrence and pulmonary metastases.
H.S.	F. 53	Left	4 weeks	1¼	Fibromyxosarcoma	Fibroma	Radical mastectomy	Nil	No evidence of local recurrence or metastases in 6 months.
B.T.	F. 60	Right	6 months	"large"	Fibrosarcoma	*De novo*	1. Simple mastectomy. 2. Excision of local recurrence 6 weeks later.	Nil	Local recurrence within 6 weeks. Died 14 months after mastectomy.
Case 3 M.C.	F. 51	Right	Discovered on routine examination	2½	Adenofibrosarcoma	Fibroadenoma	Radical mastectomy	Nil	Alive with no evidence of recurrence or metastases in 6 years and 2 months.
M.P.	F. 80	Left	?	4	Fibromyxosarcoma	?	Simple mastectomy	Nil	Died 7 months following operation. No local recurrence. No known distant metastases (no autopsy).
M.F.	F. 83	Right	1 month	3	Fibromyxosarcoma	Soft fibroma	Simple mastectomy	Nil	Died within one year with symptoms of senility. No known metastases.
M.	F. ?	?	?	"large"	Fibromyxosarcoma	Fibroma	?	?	Untraced.
J.L.S.	M. 65	Left	6 weeks	2½	Neurofibrosarcoma	Molluscum fibrosum	1. Local excision. 2. Excision of local recurrence 20 months later and again 13 months later.	5 courses	Recurred locally in 20 months and again 13 months later despite extensive radiation. Alive 5 years and 8 months after first biopsy, with local recurrence.
Case 4 W.McR.	F. 54	Left	?	½	Neurofibrosarcoma	Neurofibroma	Simple wide excision	Nil	Alive and well with no recurrence in 12 years
F.T.	M. 52	Right	1 month	Multiple ¼-½	Malignant lymphoblastoma (round cell sarcoma)	*De novo*	Local excision for examination only	1 course	1. Axillary nodes involved at time of operation. 2. Died 4 weeks later.
Case 1 I.B.	F. 74	Right	2½ years	1	Chondrosarcoma	Solitary cyst (localized cystic lobular hyperplasia)	1. Simple mastectomy followed by 2. Resection of pectoral muscles and axilla.	1 course	1. Axillary node metastases occurred within 4 weeks of simple mastectomy. 2. Died 4 months after 1st operation with massive local recurrence and pulmonary metastases.

like attachment to the chest wall. Most of the bulk of the breast was composed of a circumscribed mass, about two and one-half inches in diameter, over which the skin could be moved freely. The left breast and the axillæ appeared normal. The heart was slightly enlarged to the left and there was a soft systolic murmur in the aortic area. A_1 and M_1 were of diminished intensity and the blood pressure was 150 systolic and 80 diastolic. A roentgenogram of the lungs showed no metastases or other disease. Because of the apparent frailty of the woman, her age, and the apparently local confines of the tumour which appeared cystic, a simple mastectomy was performed on February 26, 1948, followed by an uneventful convalescence.

Pathological report.—"The gross appearance reveals a breast containing a simple cyst, two and one-half inches in diameter, with a whitish, well-defined cartilaginous mass one inch in diameter attached to one margin. Histological examination reveals it to be a vascular, anaplastic chondrosarcoma containing some osteoid tissue and numerous multinucleated tumour giant cells."

Unfortunately, this report was not obtained by the surgeon until some four weeks later, after the patient had returned to his office complaining of a "burning feeling" and a lump in the right axilla. The mass was hard, irregular in outline, and attached to both the overlying skin and the pectoralis major muscle. It was very tender when palpated. Upon receiving the pathologic report, the surgeon referred the patient to the Victoria General Hospital for radiation therapy, and further investigation was carried out. A moderate anæmia of 3,950,000 erythrocytes and 80% hæmoglobin (Sahli) was found. The white blood cell count was 6,100 and both the urinalysis and the Kahn test were negative. Roentgenograms of the lungs, lumbar vertebræ, and pelvis showed no signs of metastases, and an operative resection of the axilla and pectoral muscles was performed on April 22, 1948. A large segment of skin, both pectoral muscles and the axillary lymph nodes were removed, and a transfusion of 500 c.c. of whole blood was given during the operation.

Pathological report.—"The gross examination reveals a conglomerate mass of firm whitish lymph nodes, three inches in diameter. Histological examination reveals an anaplastic sarcoma similar to the original breast tumour except that no chondromatous tissue is present."

Twelve days after the operation, a course of radiation therapy was begun, consisting of a total dosage of 2,700 R's to each of 4 ports in the right thorax and right supraclavicular region. Twenty-five days later the patient was discharged and advised to return for more radiation. However, she died at home within three months with a massive local recurrence and a persistent cough, probably due to pulmonary metastases.

Comment.—Both this patient and her daughter, who is a school teacher, knew of the existence of the breast tumour for two and one-half years, and yet no medical advice was sought, and it was eight weeks after the tumour began to increase in size before they decided to have medical consultation. Our medical campaign to "detect cancer early" did no good in this case.

The delay experienced by the surgeon in receiving the first pathological report was unfortunate, because he thought that he was dealing with a simple cyst. The regional recurrence following the simple mastectomy and the local recurrence and pulmonary involvement following the radical resection and radiation were very rapid. The lymph spread preceded the blood-stream spread in this case by several weeks, manifesting itself first by metastases in the axillary lymph nodes.

In retrospect, the patient survived both operations very well, despite her age, and a radical mastectomy in the first instance might have given her a better chance of survival.

CASE 2

Mrs. E.D., 56 years of age, was first seen by us on March 31, 1949, when she was having a course of radiation therapy as an outpatient at the Victoria General Hospital.

At the age of 33, the patient sustained a blow on the left breast and within 24 hours there developed a small tender lump which disappeared after three months. She had no other previous diseases of the breast. Her obstetrical history consisted of one delivery, 36 years ago, and two miscarriages. Her menstrual periods were of the 2 to 3, 28 day type until the menopause, which occurred at the age of 51. There was no family history of malignancy.

At the age of 54, in February, 1947, the patient had a tumour removed from the left breast. It had been growing slowly over a period of two to three months, in the exact location where the traumatic tumour had been several years previously. The tumour was about three inches in diameter, lobulated, well encapsulated, and it contained a pea-sized calcified area. Histological examination revealed a simple fibro-myxoma with an area of calcification. Six weeks later, she noticed a small lump directly under the scar of the previous operation and some weeks later it was removed for examination. It was very myxomatous and there were no irregular cells or heterotype mitotic figures, but because of the rapidity of growth and the myxomatous nature, it was suspected of being sarcomatous. Subsequently, in June, 1947, a simple mastectomy was performed. Three months later, a local recurrence was noted in the form of three small nodules, which were removed in September, 1947. Histological examination of these nodules showed them to be of a fairly cellular fibromyxomatous nature with some large irregular and atypical cells and the condition was then regarded as being definitely a fibromyxosarcoma. Within two weeks of this operation, two more nodules made their appearance but the patient was becoming very discouraged with so many operations and she did not report to her doctor for nearly three months, at which time they were removed. Still again, one week after operation, another nodule was found by the patient and it grew rather slowly for three months but then it enlarged very rapidly in two weeks to a mass two inches in diameter, when it was removed. Because of the necessity of excising so much skin, some traction was required to close the wound, and before the sutures were removed, the growth recurred, separating the skin edges and protruding as a fungating mass. A course of radiation therapy was given, lasting from March 15 to May 15, 1948, and the tumour "melted away". She failed to return in three months for a second course of radiation and in November, 1948, the tumour recurred very rapidly, again growing to over two inches in diameter in two weeks, and for the first time it was accompanied by pain. It was similarly removed, only to recur again in February, 1949, when it grew from a tumour one-half inch in diameter to a mass five inches in diameter in less than one week. Following local removal, it was found to be of a very myxomatous nature with the skin stretched and thinned over its surface, but the skin was not invaded. It was markedly cellular on histological examination.

The wound partially healed, leaving an ulcer which has a necrotic base and measures one and one-half inches in diameter. The skin over the anterior surface of the left side of the chest is chiefly scar tissue and it is very tender in areas. The left pectoral area contains a diffusely solid, rounded mass, four inches in diameter, firmly attached to the pectoralis major muscle and there

is a local extension over the sixth rib in the anterior axillary line. No axillary or supraclavicular lymph nodes are palpable. The involvement of the pectoralis muscle is causing considerable pain and disability, preventing the use of the left arm.

Roentgenograms of the lumbar vertebræ and pelvic bones fail to show any evidence of metastases, but there is massive pulmonary involvement.

Comment.—This patient has had a total of 8 operations during the past 28 months, including a simple mastectomy, and two courses of radiation therapy. Within this period of time, the tumour has progressed histologically from a benign fibro-myxoma to a very cellular fibromyxosarcoma. The local recurrence has been very persistent. It is impossible to state definitely whether or not the trauma of 23 years ago has any etiological significance in the development of this tumour, but it is noteworthy that a lump did develop at that time and that the fibromyxoma subsequently developed at the identical area of trauma. The pea-sized area of calcification could well be a localized calcified area of traumatic fat necrosis. The ulcer is a consequence of skin deficiency and there is no evidence of skin involvement by the sarcoma. This is not remarkable when it is remembered that sarcoma is a connective tissue tumour.

CASE 3

Miss M.C., a 51-year old unmarried woman, consulted her doctor in January, 1943, for bronchitis. During the physical examination, a lump was palpated in the upper outer quadrant of the right breast. It was about two and one-half inches in diameter and freely movable, being unattached either to the skin or to the deeper structures. The patient was suffering no pain and there was neither discharge from the nipple nor retraction of the nipple. No axillary lymph nodes were palpable. The past history regarding the breasts revealed nothing of significance and, in fact, the presence of the tumour was unknown to the patient previously.

A radical mastectomy was performed on February 1, 1943, and the pathological report was as follows: "The gross appearance reveals a breast containing a firm, whitish and fairly well circumscribed mass, two and one-half inches in diameter. No lymph nodes are found. Histological examination reveals a fairly cellular fibrosarcoma." This patient had neither pre- nor post-operative radiation therapy and is alive and well with no evidence of local recurrence or regional or distant metastases six years and two months later.

Comment.—This patient is one of the three in this series whose breast sarcoma was treated by radical mastectomy and she is alive and well over six years later. One other is alive and well six months after radical mastectomy for a fibromyxosarcoma one and one-quarter inches in diameter with no evidence of spread at the time of operation. The third patient has already been mentioned (Case 1).

CASE 4

Mrs. W. MacR., a 54-year old woman consulted her surgeon in July, 1937, because of a small raised nodule on the left breast. Her past history was normal. She was primigravida, having had one child at the age of 24 years. She had had no miscarriages, menstrual irregularity, abnormal lactation, trauma to the breast, nor any previous breast disease, and had experienced the menopause at the age of fifty.

The only complaint on first examination was the presence, in the subcutaneous tissue of the infero-medial aspect of the left breast, of a small warty growth which recently had begun growing. She had no idea how long it had been present. There was no pain, nipple discharge or retraction, eczema, or ulceration, and no evidence of regional or remote metastases. The other breast was normal and the serological test for syphilis was negative.

A simple wide excision of the tumour was performed on July 14, 1937. No pre- nor post-operative radiation therapy was given.

Pathological report.—"The gross appearances have the characters of a small, subcutaneous, hard fibroma, measuring one-half inch in diameter. The histological appearances, however, reveal a neurogenic sarcoma, or fibro-neuro-sarcoma, which is apt to recur."

The patient is living and well, twelve years post-operatively, with no evidence of recurrence, regional or distant metastases.

Comment.—The diagnosis in this case was not suspected either clinically, or on gross examination of the surgical specimen; only on histological examination was its true nature appreciated. Early medical consultation and early wide excision, without radiation therapy, has given an excellent result. Ordinarily, this type of sarcoma recurs quite rapidly following local removal and is very resistant to radiation.

TABLE II.

Type of sarcoma	*Number of cases*		
	Our series	*Lahey clinic*	*Adair and Herrmann*
Adenofibrosarcoma	2	6	9
Fibrosarcoma (spindle cell)	6	0	56
Neurofibrosarcoma	2	0	3
Lymphoblastoma (round cell)	1	1	4
Chondrosarcoma	1	0	1
Liposarcoma	0	1	4
Malignant melanoma	0	1	not included
Cystosarcoma	0	0	7
Angiosarcoma	0	0	3
Perithelioma	0	0	3
Polymorphous cell	0	0	2
Giant cell	0	0	1
"Sarcoma"	0	0	3
Unknown	0	0	4
Total	12	9	100

Types of sarcomata in our series of twelve cases, Lahey clinic[2] series of nine cases, and collection of one hundred cases from various authors classified by Adair and Herrmann[3].

CONCLUSIONS

1. Sarcoma composed 0.87% of malignancies of the breast received at the Pathological Insti-

tute, Halifax, during the 17-year period from 1932 to 1948.

2. Sarcoma of the breast was five times more common in women than men in our series of twelve cases.

3. A very prominent clinical feature has been the rapid growth of the tumour, especially in its local recurrence.

4. Local removal of the sarcoma or simple mastectomy has been followed in many cases by a local recurrence.

5. The axillary lymph nodes were known to be involved in only two instances, the malignant lymphoblastoma and the chondrosarcoma, but since examinatioon of the axillary nodes was done in only two other cases, it cannot be stated definitely that they were not involved in the remaining 8 cases.

6. It would seem that an early wide resection, including removal of the pectoral muscles, but not necessarily of the axillary lymph nodes, offers the best chance of cure in the majority of breast sarcomata, which are either fibrosarcomata or adenofibrosarcomata in type.

7. So few of the reported cases have had radiation therapy that valid conclusions cannot be drawn.

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CASE REPORTS

URETHANE IN THE TREATMENT OF MULTIPLE MYELOMA

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Multiple myeloma is a progressively fatal disease of the bone marrow characterized clinically by bone pain and pathological fractures; biochemically, by an elevation of the serum protein due to an excess of the globulin fraction; pathologically, by destructive bone lesions owing to a proliferation of plasma cells in the marrow, and hæmatologically, by a progressive anæmia. Death may result from kidney damage or from a "stasis" pneumonia as a result of poor excursion of the thoracic cage brought about by the severe pain from rib involvement.

To date the treatment of the disease has been highly unsatisfactory. Roentgen therapy applied to the painful areas of bone destruction will give symptomatic temporary relief, but has no effect on the course of the disease. Radioactive phosphorus may have a field of usefulness but the occurrence of a panhæmatocytopenia is a complication all too common. Stilbamidine has been reported as being a useful agent in the control of the disease, but in this Clinic, the results have been disappointing. Urethane is a cytotoxic agent which has been known for many years. It has been used clinically with little success in various types of malignancies, especially the leukæmias. Its usefulness has not been sufficient to supplant the standard methods of treatment, however. Multiple myeloma would appear to be an exception. The following case is being presented as an example of the results obtained in a single case. The beneficial results obtained in all phases of the disease process are encouraging, and publication of even a single case would appear to be justified.

This 66-year old male was admitted to the Saskatoon Cancer Clinic on July 18, 1949, complaining of pain in the back and ribs for five years and a loss of 25 lb. in weight in one month. He had had asthma all his life with a chronic cough and sputum. Shortness of breath had been present for six months. There was no ankle œdema.

Physical examination showed a poorly nourished man. Chest excursion was limited by pain. Breath sounds were faint and numerous coarse and fine râles were heard over the whole chest. There was a swelling 6 x 3 cm. in the left sixth rib anteriorly which was quite tender. There was tenderness over the whole vertebral column with associated muscle spasm, and also over the whole thoracic cage. Examination of the abdomen, rectum and lymphatic system was negative.

Laboratory findings: Hb. 68%; red blood cells 37,000,000; white blood cells 7,150; polymorphonuclears 53; rhabdocytes 7; lymphocytes 30; monocytes 10. Sedimentation rate 51; urinalysis was negative; Bence Jones was negative. Total protein 9.4 gm.; serum albumen 1.9 gm.; globulin 7.5 gm.; cephalin flocculation negative; tuberculin negative; non-protein nitrogen 34 mgm. %; phenolsulphonphthalein showed 28, 38 and 43% in three specimens. X-ray bone survey showed circumscribed areas of rarefaction in the skull, both shoulder girdles, ribs, clavicles and scapulæ, suggestive of multiple myeloma. Chest plate showed bilateral infiltrative and fibrotic lesions throughout both lung fields. Sternal puncture showed "plasma cell myeloma".

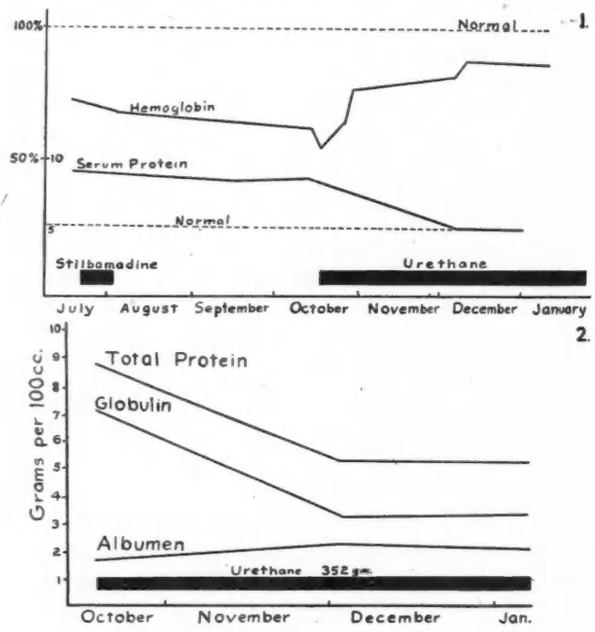
July 22, stilbamidine begun: 1,798 mgm. was given intravenously in 11 days. Assessment on completion of treatment showed no changes in symptomatology or biochemical findings.

September 15, re-admitted complaining of pain in the chest and generalized weakness. Examination revealed the patient to be in poor condition, and bone pain was marked. No therapy given. Discharged on patient's insistence.

October 13, re-admitted for terminal care. General condition was poor. The patient had severe bone pain requiring morphine.

October 18, urethane therapy was started—2 gm. daily given in 0.5 gm. capsules for one week, then increasing to 4 gm. daily. The drug was well tolerated. General condition slowly improved. Pain lessened.

December 8, up and about the ward. Pain required no sedation. Cough still troublesome. The patient was continued on urethane, 1.5 gm. daily. Repeat sternal puncture showed "No abnormal cells". A repeat bone survey showed no progression of the destructive lesion. A summary of the blood changes during the course of treatment is found in the table.



DISCUSSION

This patient presents the picture of a generalized myelomatosis with clinical, radiological and marrow examination confirming the diagnosis. A single course of stilbamidine did not arrest the disease process, nor did it relieve the pain, and the patient continued to deteriorate. On urethane therapy, the following beneficial results were obtained: elevation of hæmoglobin and restoration of the protein level to normal as shown in graph I; an approximation of the A/G ratio to normal, as shown in graph 2; elimination of the plasma cell picture in the sternal marrow and arrest of the progression of the destructive lesions in the bones. No depression of the white blood count was noted, except for a temporary drop to 3,900 after 532 gm. of urethane had been given over a period of 61 days. The count was rapidly restored when the dose was reduced to 1.5 gm. daily as a maintenance dose. The differential count showed a reduction of the lymphocytic elements from 38% at commencement of the urethane to 8% after two weeks of treatment. This lymphopenia has persisted. No depression of the platelet count was noted. It would seem that urethane has acted in a specific manner in this case to arrest the disease process. This has not been obtained by us with the use of any other agent, including stilbamidine. Further clinical trials will be necessary to evaluate the true value of this agent. Serum calcium and electrophoretic studies will be carried out in future cases.

SUMMARY

A case of multiple myeloma is presented which shows clinical, histological, biochemical and hæmatological improvement on urethane therapy after failure to arrest the disease with stilbamidine.

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TABLE I.

A SUMMARY OF THE BLOOD CHANGE DURING THERAPY WITH STILBAMIDINE AND URETHANE

Date	Hgb.	R.B.C.	W.B.C.	Diff. count: Polys.	Lymphs.	Monos.	Platelets	Serum protein: Total	Alb.	Glob.	Bence Jones	Remarks
July 18, 1949	72	3.9	7,150	60	30	10		9.4	1.9	7.5	Neg.	
July 22, 49												Stilbamidine begun.
August 3, 49	68	3.7	4,200	46	37	10		9.2	1.6	7.6	Neg.	Stilbamidine ended. Dose: 1,798 mgm.
September 15, 49								8.4	1.2	7.2		Admitted to hospital.
October 13, 49	62	3.3	4,850	43	38	13		8.8	1.6	7.2		Re-admitted for terminal care.
October 18, 49	55	3.0	7,450				160,000					Urethane begun. 2 grams daily for 7 days; then 4 grams daily.
October 26, 49	64	3.4	6,900	77	8	12						
November 29, 49	77		5,200									
December 2, 49							210,000	5.3	2.1	3.2		
December 6, 49	81		6,300									
December 16, 49	81		5,900									
December 23, 49	83		3,900								Neg.	
December 29, 49								5.3	2.0	3.3		Sternal puncture—no abnormal cells. ? improvement on x-ray. *352 grams.*
January 10, 1950	85		8,500									Continuing on therapy. 1.5 grams daily.

ADENOCARCINOMA OF THE PAROTID IN A TEN YEAR OLD CHILD

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Carcinoma of the parotid gland in children is rare. In 1940, Case[1] reported an epidermoid carcinoma of the parotid in a child, age 11, which is the youngest proved case reported to date. The only other reference to its appearance at an early age is a case in a boy of 15 reported by Benedict and Meigs[2] in 1930. In 1904 Jambon* reported an instance of an epithelioma in the anterior prolongation of the parotid gland in a child, age 6, but he was unable to state with certainty that the tumour originated in the parotid gland.

The following case is reported to record the occurrence of an adenocarcinoma of the parotid in a 10 year old child who has been observed for over two years following total parotidectomy. The malignant nature of this tumour was not suspected prior to operation and pathological examination.

A 10-year old child was admitted to the Jewish General Hospital on January 7, 1947. A small swelling below the left ear was first noticed one month prior to admission. During that month there was an increase in size of the elevated area. There was no associated pain.

On admission, a mass, measuring two centimetres in diameter, was present in the left parotid gland; it was freely movable and not tender. There were no palpable regional lymph nodes.

A diagnosis of mixed tumour of the parotid gland was made and operation performed. At operation a cystic mass was found which was very friable and contained grumous material suggestive of malignancy. The mass was removed without injury to the facial nerve.

Pathological examination revealed a moderately well differentiated adenocarcinoma of the parotid gland (Fig. 1). There was no evidence of vascular or lymphatic invasion.

The postoperative course was uneventful, and the patient was discharged one week after operation. On January 21, she was started on a course of deep x-ray therapy to the left parotid gland area. She received nine doses of 300 R. each.

The child was readmitted six weeks later for total resection of the left parotid gland. On examination, the scar was well healed; there were no palpable lymph nodes, and chest x-ray did not show any metastases. At operation, the gland was completely removed and was found to be quite fibrotic. The branches of the facial nerve were carefully dissected free and preserved.

Pathological examination revealed fibrosis and atrophy of the parotid gland with two small areas of residual poorly differentiated carcinoma (Fig. 2). Multiple sections revealed no invasion of the supporting tissue.

The postoperative course was uneventful save for a mild facial paresis on the left side which recovered completely.

The child remained apparently well for two years. She was re-examined on March 20, 1949, when a small nodule, about one centimetre in diameter, was found in the region of the excised parotid gland; this nodule was removed. Microscopic examination revealed adenocarcinoma, salivary gland type, in fibro-adipose tissue (Fig. 3). Following excision of this nodule, the patient received a further course of deep x-ray therapy, consisting of 4,300 R.

* Cited by Case.[1]

DISCUSSION

Carcinomas of the parotid gland usually occur between the ages of 32 and 78;[2 to 5] only two cases have been reported in children under 16.

Carcinomas of the parotid gland usually occur in an older age group, grow more rapidly and are more often associated with pain than mixed tumours. However, the clinical differentiation is difficult and often impossible; hence, the possibility of carcinoma must always be considered and can only be excluded by histological examination.

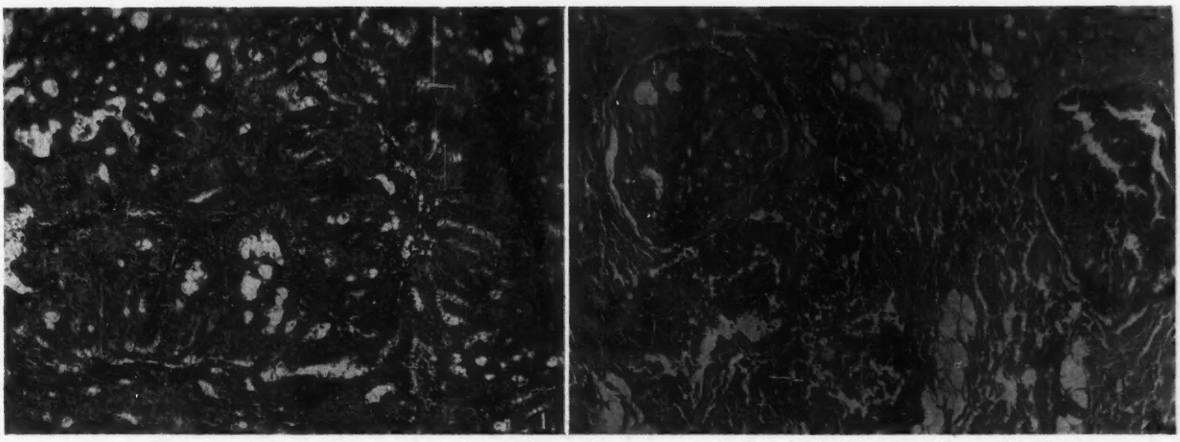

Fig. 1.—Microphotograph of portion of mass excised at first operation, showing moderately well differentiated adenocarcinoma of salivary gland. **Fig. 2.**—Microphotograph of tissue removed at total parotidectomy following irradiation, showing fibrosis and atrophy of parotid gland with residual poorly differentiated adenocarcinoma.

The treatment of carcinoma of the parotid is total excision of the gland. Deep x-ray therapy for this form of cancer has not been encouraging; however, its use as an adjunct to surgery is recommended for it is felt that its possible benefits should not be denied patients suffering from this disease.[6]

The prognosis in carcinoma of the parotid is poor. The tumour, though encapsulated at first, soon invades the gland and spreads to the regional lymph nodes.[7] Local recurrence is rapid and usually occurs in a matter of months rather than years.[2] Early operation with total excision of the parotid gland is the only hope of cure.

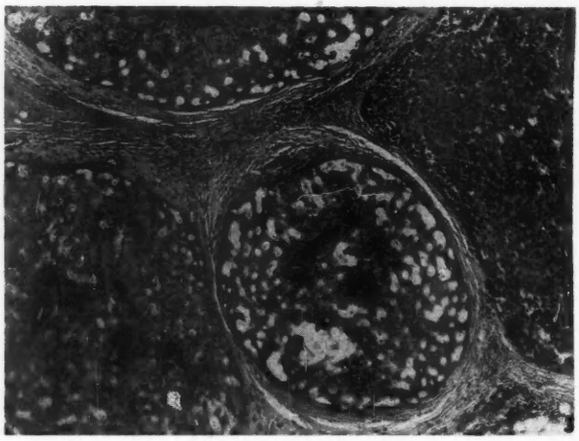

Fig. 3.—Microphotograph of nodule removed two years after total parotidectomy, showing adenocarcinoma, salivary gland type, in fibro-adipose tissue.

SUMMARY

1. A case of carcinoma of the parotid gland in a ten year old child is presented. We believe that this is the youngest case recorded.

2. The importance of surgical removal of tumours of the parotid gland for the diagnosis of early carcinoma is emphasized.

3. Complete excision of the parotid gland with adjuvant x-ray therapy offers the best results. However, the prognosis is poor.

We should like to express our thanks to Dr. M. A. Simon for the pathological descriptions.

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HYPODERMAL MYIASIS CAUSED BY LARVÆ OF THE OX-WARBLE (HYPODERMA BOVIS)*

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Human hypodermal myiasis may be defined as an infestation of the subcutaneous tissues of man by larvæ of the warble flies of the genus *Hypoderma*. The larvæ hatch from eggs deposited by the adult fly on the skin, hairs or clothing of the host, and bore through the skin to reach the tissues below.

The two species of warbles, *Hypoderma bovis* and *H. lineatum*, are widely distributed throughout the United States and Canada, and in many areas their larvæ (grubs, warbles, etc.) are extremely common in cattle. However, while man is known to be susceptible to this infestation, relatively few human cases have been reported.

As early as 1875 a human case of subcutaneous infestation by larvæ of the warble fly was described by Allen[1] of Chicago. This was diagnosed as *H. bovis* and is of special interest here because, according to the author, the infestation was acquired in Canada in the Province of Prince Edward Island. From that time to the present it has been possible to find references to only eight cases of hypodermal myiasis in man reported in the United States.[2] Four were diagnosed as *H. lineatum*, three as *H. bovis*, and one was undetermined as to species. According to C. G. MacNay of the Division of Entomology, Canadian Department of Agriculture, there have been four reported cases of hypodermal myiasis in Canada, all caused by *H. lineata*. Two of the cases occurred in Saskatchewan and the other two in Alberta. The present case is from New Brunswick and is thus, counting the case of Allen (*loc. cit.*), the second case reported in Canada caused by *H. bovis*. The history is as follows.

The patient is a male child, five years old, who lives in rural New Brunswick. He was first seen in October, 1948, with inflammation of the right ankle. In hospital the ankle returned to normal within several days but a bruise-like area appeared on the right calf. The child was discharged from hospital but was brought in again in November, with a swollen, painful knee joint. A tentative diagnosis of acute septic arthritis was made

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and treatment with penicillin started. Response to penicillin was very slow. However, the knee returned to normal in five or six days.

The child was sent home and not seen again until January, 1949, but in the interval he was stated by his mother to have shown areas of redness and swelling which migrated over the neck, shoulders, and chest. When seen in January he showed a round area of inflammation on the right thigh with a small circular opening at the apex. Gentle digital pressure caused the extrusion of a maggot-like object. This was not examined. However, two weeks later he was seen again with a similar lesion on the right calf from which a second maggot about half-an-inch long was removed. On examination this proved to be a third-stage larva (classification of Laake, 1921) of the cattle warble fly, *Hypoderma bovis* (Fig. 1). At this time a differential white blood cell count revealed an eosinophilia of 20%.

The child was seen again in April, with a mildly inflamed circular area on the back of the neck in the centre of which there was a small opening (Fig. 2). The larva could be seen moving in the opening. Considerable digital pressure was required to expel the larva which

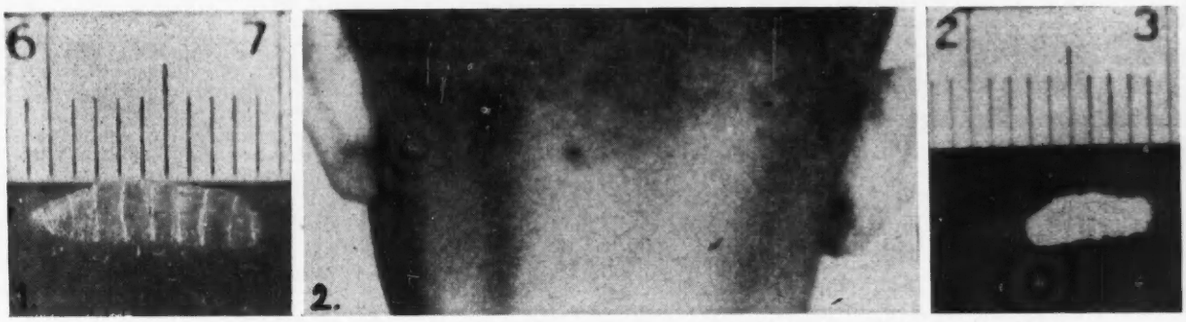

Fig. 1.—Third-stage larva of *Hypoderma bovis* removed from leg of five-year-old boy; the larva has been cleared in caustic potash to show segmentation. (Scale in millimetres.)
Fig. 2.—Lesion on back of neck of five-year-old boy caused by larva of *H. bovis*: note relative absence of host tissue reaction around "air-hole" cut through skin by larva.
Fig. 3.—Third-stage larva of *H. bovis* removed from lesion on back of neck shown in Fig. 2. (Scale in millimetres.)

was recovered in a somewhat damaged condition (Fig. 3). Prior to his last visit the mother states he had a swelling inside the mouth and an area of inflammation on the knee. It is of interest to note that shortly before the first visit the mother states the child coughed up an object similar to that expressed from the thigh.

The history as described above is essentially similar to previously reported cases, and is characterized by transient swellings which migrate over the body frequently, but not always in an upward direction. The swellings, which are probably caused by a temporary more superficial position in the host of the migrating larvæ, vary in size from several millimeters to 7 to 8 centimeters and are usually neither fluctuant nor indurated. The migrations of the larvæ under the skin and the formation of swellings may be accompanied by severe pain and tenderness, or, in other cases, give rise to only a mild prickling sensation. The severity of symptoms is probably directly related to the degree of sensitivity established by the presence of the larvæ. In the majority of cases symptoms appear during the late autumn and continue through the winter to early spring. At any time during their wanderings, but most commonly from February to April, the larvæ localize and cut an air hole through the skin in which they can occasionally be seen moving, and through which they are usually removed. The larvæ are almost always in the third stage when removed and range from 7 to 15 mm. length by 2 to 4 mm. in thickness. They are white to cream in colour and are devoid of spines but show segmentation with some wrinkling of the cuticle. Of nearly 50 cases of hypodermal myiasis that have been reported from various countries of the northern hemisphere,[2] twice as many children were infected as adults, while males where found infected three times as often as females.

While there are several species of flies in this country whose larvæ may be found causing human cutaneous myiasis (invasion of the skin by fly larvæ), cases of hypodermal myiasis can usually be differentiated by the migrating habits of the larvæ under the skin. Larvæ of the horse botflies, *Gastrophilus* spp., occasionally cause a creeping cutaneous myiasis in man, but they can be differentiated by the fact that the migrating channels of the larvæ are very superficial and can be seen quite clearly on the skin; the symptoms are never as painful, and the larvæ, which do not grow well in man, usually measure from 1 to 2 mm. in length.

A differential diagnosis of hypodermal myiasis should not be difficult if the possibility of such a diagnosis is kept in mind; the seasonal distribution, the transient migratory areas of inflammation, and the high eosinophilia, will

help to indicate the diagnosis, and finally, the localization of the larvæ with the formation of a punctate opening in the skin and eventually the recovery of the characteristic larva, will confirm the diagnosis.

While hypodermal myiasis may cause a great deal of discomfort and pain, the prognosis is usually excellent. A fatal case has been reported by Hamilton,[3] but the history would indicate that death was due to a concomitant bacterial infection. The only treatment is surgical removal of the larvæ when they can be localized. If the air-hole has been cut through the larvæ can usually be expressed by gentle digital pressure, or if that fails, the opening can be enlarged by incision and the larvæ removed. Crushing of the larvæ *in situ* should be avoided because of possible anaphylactic shock. While this has never been reported in man, it has occasionally occurred in cattle where the larvæ have been crushed while still in the host tissue.

The term hypodermal myiasis has been used here to indicate specifically an infestation by larvæ of the ox-warble flies, *Hypoderma* spp. In the past this condition has been referred to as creeping cutaneous myiasis, cutaneous myiasis, and creeping eruption. The term "creeping eruption" should be retained for skin infestation by larvæ of certain nematode species (*Ancylostoma braziliense*, etc.), while "creeping cutaneous myiasis" is not sufficiently specific and usually refers to infestation by larvæ of the horse bot fly (*Gastrophilus* spp.). Cutaneous myiasis is purely a descriptive term and refers to the finding of any fly larva under the skin.

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OVERDOSAGE WITH DEXEDRINE

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No instances of a toxic effect of dexedrine on blood-forming organs have been found in medical literature. There are references to benzedrine's successful use in suicidal attempts, but in these latter incidents death followed within several hours, without evidence of damage to blood elements. The case to be reported refers to a nurse-in-training, who consumed massive doses of dexedrine over a prolonged but indeterminate period.

On February 26, 1949, the patient, a female nurse, aged 21 years, complained of tiredness and a sore throat. Previous medical history disclosed only childhood contagious diseases. For the past month there was increasing tiredness. The temperature was 102° F., pallor was obvious; there were enlarged cervical lymph nodes, and the tonsillar surface presented discrete follicular exudate. There were petechial hæmorrhages in the soft palate. Inguinal lymph nodes were enlarged; the spleen was not palpable; generalized petechial hæmorrhages appeared in the skin on February 27, and followed at irregular intervals until death. One dose of sulfadiazine was given (15 grains) but was not repeated; on February 26, penicillin in a dosage of 40,000 units every 3 hours was given and continued for four days. On March 1, the temperature was normal and did not rise above 99° until March 10, when it rose to 101° F. Thereafter it remained high (101 to 105) until death. Epistaxis occurred at intervals but was controlled by nasal packing. On March 13, menstruation began (it was two weeks delayed, having been previously regular, except that the preceding period was described as profuse and lasting 12 days). Bleeding *per vaginam* continued, until death. On March 18, hæmatemesis occurred, and hæmatemesis and melæna thereafter, with vaginal bleeding, gradually exsanguinated the patient in spite of the administration of large quantities of whole blood, a total of 17 litres being given during hospitalization. The Wassermann was negative. Urinalysis was negative except for a few red cells. Several blood cultures were negative. X-rays of the chest were normal. Death occurred March 22. There was no autopsy.

BLOOD STUDIES

February 26.—Hgb., 8.3 gm. White blood cells, 1,500. Neutrophils, segmented 180, juvenile 110; lymphocytes 1,050.

February 28.—Hgb. 9.3 gm. Red blood cells 3.4 million, reticulocytes 0.0%, mean corpuscular Hgb. 27.5 γγ. Platelets 10,000. White blood count 1,300. Neutrophils, segmented 0, juvenile 117, myelocytes 26; eosinophils 13, lymphocytes 1,144.

Bleeding time, 3 minutes; clotting time, 22 minutes; prothrombin, 100%; no abnormal cells seen.

March 1.—Bone marrow, sternal aspiration: nucleated cell count 39.0 thousand (normal, over 50.0); megakaryocytes, none present on smears; erythroid series, maturation arrested at erythroblast level; very few normoblasts present.

Granulocytes.—Predominant cells are myelocytes and metamyelocytes, maturation showing no progression to segmented forms. Eosinophils are present. Lymphocytes are present in normal members.

Opinion.—Maturation arrest involving erythrocyte, granulocyte and megakaryocyte series. Typical of pancytopenia due to drug intoxication.

March 3.—Hgb. 9.1 gm. Red blood cells 3 million, mean corpuscular hgb. 30 γγ.

March 8.—Hgb. 7.6 gm. Red blood cells 2.6 million; reticulocytes 0.0%; mean corpuscular hgb. 30 γγ; white blood cells 3,100; neutrophils, segmented 0, juvenile 124; platelets 30,000.

March 10.—Hgb. 7.3 gm. White blood cells 2,000.

March 15.—Hgb. 9.5 gm. Red blood cells 3 million, mean corpuscular hgb. 31.5 γγ, reticulocytes 0.2%, white blood cells 600. No granulocytes present on smear. Platelets 50.0 thousand. Bleeding time 3 minutes. Clotting time 17 minutes.

March 19.—Hgb. 9.0 gm. Red blood cells 3.1 million, mean corpuscular hgb. 28.5 γγ, reticulocytes 0.0%, white blood cells 900. No granulocytes present on smear. Platelets 40,000.

The blood and bone marrow examinations carried out at the time of admission to hospital demonstrated a well-advanced state of pancytopenia, there being no evidence of megakaryocyte platelet production, the maturation of the erythrocytes being arrested at the erythroblast level, granulocytes showing poor maturation beyond the myelocyte stage. There was no apparent involvement of the lymphocyte or reticulum cell series.

Acute panhæmatocytopenia, associated with generalized hypoplasia of the bone marrow may be associated with a number of conditions, but drug intoxication, especially due to compounds having a benzene-ring structure are the most frequent and most serious offenders; benzol, sulfonamides, barbiturates, and pyramidon are well known in this respect. The exact mechanism of poisoning is not clear but individual idiosyncrasy or hypersensitivity appears to play some part in the sequence of events.

Progressive anæmia, granulocytopenia and thrombocytopenia are the presenting hæmatological manifestations. Infection of the mucous membranes often associated with ulceration, and hæmorrhagic phenomena, petechiæ, ecchymoses and mucous membrane hæmorrhages are the outstanding clinical manifestations.

The prognosis is very serious, exsanguination or hæmorrhage into vital organs being the usual cause of death. Spontaneous recovery of hæmopoiesis may avert death, especially in the post-infectious form and in sulfonamide poisoning. No known therapeutic measure will ensure stimulation of blood formation, although numerous drugs have received enthusiastic support. Pyridoxine, pentnucleotide, transfusions of fresh blood have had some success. The control of mucous membrane infection and attendant ulceration, formerly with sulfonamide poisoning) and more recently with penicillin, and the transfusion of large quantities of fresh blood may preserve life until spontaneous recovery of the bone marrow occurs. In certain cases the severity of hæmorrhage may be reduced by the administration of toluidine blue to combat heparin-like anticoagulant substances.

When the possibility of drug intoxication or idiosyncrasy was entertained in this case, she informed us that she had been taking dexedrine for nine to twelve months, to reduce her weight; and that the last dose had been about a month previously. Following her death a pharmacist, who had refilled a prescription found in her personal effects, produced the information that in the period February 2 to February 28, she had been issued 250 five mgm. dexedrine tablets, (1,250 mgm.); indirect information indicated that some prescriptions had been refilled at an additional pharmacist's establishment. Besides, dexedrine was available at times, in her occupation as nurse. Two prescriptions of 50 five mgm. tablets had been obtained *after* she was admitted to hospital and while the cause of her anæmia was under discussion.

Also discovered in her effects were three tablets of a capsule containing 1½ grains each of seconal, and amytal. There is no information relative to the quantity of barbiturate or duration of exposure, she may have endured.

Large doses of benzedrine have been consumed in other reported cases and the effects of benzedrine on blood-forming organs is apparently negligible. A patient with Parkinsonism consumed 160 mgm. a day (benzedrine) for three weeks without reported ill effects. Another patient consumed 15 to 30 mgm. a day (benzedrine) for nine years with no ill effects. Two cases of narcolepsy taking 70 mgm. a day (benzedrine) for two years and eight months and another taking the same dose for one year and eight months are reported without ill effect.

Benzedrine is taken in these large reputed doses chiefly for its stimulating effect. Dexedrine having a much less noticeable exhilarating effect, is less often (apparently) used for this purpose. It is possible therefore that large doses of dexedrine have an effect on blood-forming tissue that benzedrine has not demonstrated.

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I come from a state that raises corn and cotton and cockleburs and Democrats, and frothy eloquence neither convinces nor satisfies me. I am from Missouri. You have got to show me.—Willard Duncan Vandiver.

ACUTE BRUCELLOSIS TREATED WITH CHLOROMYCETIN

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In the last twenty-five years it has become increasingly evident that brucellosis is a relatively common disease, has a country-wide distribution and can be the cause of prolonged disability. With this knowledge the necessity of some curative treatment has long been sought and a great variety of vaccines, drugs and antibiotics have been tried. No uniformity of results was obtained from vaccine therapy. Drug therapy with dyes, arsenic and the earlier sulfonamides was consistently disappointing until the advent of sulfadiazine, which was felt to have some therapeutic effect. Streptomycin too was felt to be beneficial but neither of these two substances alone resulted in permanent cures. In 1947, Pulaski and Amspacher[1] pointed out that by giving sulfadiazine and streptomycin simultaneously much better results could be obtained. That this method was curative in some cases of brucellosis was evident from the reports of experienced observers.[2] However it was soon realized that it did not work in all cases.

The following year Spink[3] reported that aureomycin given orally gave more satisfactory results. With further trials the curative effect of this antibiotic has been substantiated but some failures have been reported.[4] Herrell and Barber[5] essayed the use of a combination of aureomycin and dihydrostreptomycin in their patients and reported cures in 4 patients thus treated. This form of therapy was suggested by the work of Heilman,[6] who showed that this combination was very efficacious in suppressing the growth of *B. abortus* in the spleen of infected mice.

In the past year there have been several reports on the efficacy of chloromycetin (chloramphicol) in the treatment of acute brucellosis.[7] Other investigators however believe there is some doubt as to its ultimate curative value.[4] In view of the fact that the status of chloromycetin as a curative agent in the treatment of brucellosis is still not certain we feel the following case is worthy of presentation.

J.S.L., aged 44, was admitted to the Montreal General Hospital on October 14, 1949, complaining of cough, fever and afternoon fatigue. His present illness dated back to August 15, 1949, shortly after he returned from a business trip in eastern Canada where he had visited numerous small towns and had consumed a considerable quantity of milk. He first noticed that he was running an afternoon temperature and with this he became very fatigued. Soon it was necessary for him to leave work at noon because of excessive tiredness. He noticed during this period that his cough, which he blamed on cigarettes, had become worse, although very little expectoration occurred and no chest pain was noted.

During this period he had numerous night sweats but did not note any other symptoms and he did not lose weight. He did not consult a doctor until October 10, when he was seen by one of us (C.W.F.) and was admitted to the hospital with the tentative diagnosis of acute brucellosis. His personal and family histories were irrelevant.

On examination he was a well developed, rather thin white male. His colour was good but he appeared tired and anxious. The eyes, ears, nose and throat were normal; the chest was clear. The heart was not enlarged and the sounds were normal except for an occasional extrasystole. The abdomen was not tender; the liver was not felt, but it was thought that the spleen was just palpable. His temperature varied between 98 and 101°.

Laboratory findings.—X-rays of the chest showed nothing abnormal The electrocardiogram revealed normal curves. His hgb. was 100% and the red blood cells were 5,000,000, white blood cells 8,100 with a differential of polymorphonuclears 66, lymphocytes 30, monocytes 2, eosinophils 2. Urine examination was normal.

Agglutination tests for *B. abortus* were 3 plus. The intradermal brucellergin test resulted in a violent febrile reaction with a rise of temperature to 103.4 with the production of a wheal 3 cm. in diameter. Two consecutive blood cultures were positive for *B. abortus.*

Course in hospital.—After the blood cultures had been taken he was given four grams of chloromycetin in doses of one gram every hour for four doses. Then 0.25 gm. q.3 h. was given for a two week period, when he had received a total of 30 grams. This therapy was carried out longer than has been advocated because he had had his symptoms for over 60 days prior to admission.

For three days no change was noted in his temperature but by the fifth day it had fallen to normal and has remained normal since. He rapidly lost his feeling of fatigue and this too has not returned. Although no cause was found for his cough it too disappeared with the subsidence of his other symptoms

Since leaving the hospital he has been examined on several occasions and now 6 months after his course of chloromycetin is clinically well.

SUMMARY AND COMMENT

The above patient has apparently been cured of his attack of acute brucellosis through the administration of 30 grams of chloromycetin, given over a two week period.

It would appear that chloromycetin is a very valuable curative antibiotic in the treatment of brucellosis. It is realized that some cases may fail to respond to therapy and that in some cases relapses may occur. It is suggested that in the latter cases several courses of chloromycetin might result in cures, whereas in the

former it would be wise to try aureomycin, either by itself or in combination with dihydrostreptomycin. It is felt that if all these methods of treatment now available are tried brucellosis can be cured.

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THE TRIPLE COMPLEX SYNDROME OF BEHCET

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In 1930 Adamantiades presented to the Medical Society of Athens the first recorded case of the condition now known as Behcet's triple complex syndrome, for it was not until Behcet of Constantinople in 1937 drew the various manifestations together that it became recognized as a clinical entity.

The triple complex consists of oral ulceration genital ulceration and various eye lesions ranging from conjunctivitis and iritis to thrombosis of the central retinal vein. The mouth ulcers vary from small "dyspeptic" ulcers to large necrotic sloughing areas with a sharp edge and injected margin which heal leaving a thickened scar. The genital ulcers are usually similar. Other skin manifestations noted are an erythema nodosum-like lesion and an acneform eruption. These lesions recur over a number of years. There is no constancy in the order in which they appear; one eye is usually affected alone at first, but both eyes appear always to be affected eventually. The syndrome occurs most often in males and may appear at any age but predominantly in the third decade.

To these more usual manifestations other lesions may be added. Adamantiades described periodic hydrops of the knee. Katzenellenbogen stressed hæmorrhages into the retina and vitreous in two cases, and also noted relapsing epididymitis and a peculiar skin sensitivity in that puncture was invariably followed by pustule formation. O'Donnel's case had orchitis and Prosser Thomas's thrombosis of leg veins, also noted by Whitwell, and of the inferior vena cava and central retinal vein. A chronic dyspepsia is frequently present and Whitwell mentions that ulceration has been seen gastroscopically. Knapp described neurological involvement which recovered and Prosser Thomas's case was suspected of cerebral neoplasm owing to severe headache, vomiting and equivocal eye signs. A case recorded by Berlin, after following the usual course developed mental changes and headaches and passed into convulsions and coma with a fatal issue.

The syndrome appears to have been known in partial form for some time as it seems that lesions such as ulcus vulvæ acutum and periadenitis mucosa necrotica recurrens are of the same type.

The etiology is unknown. Most authors have been unable to find any convincing sites of focal sepsis. Behcet originally described elementary bodies which resembled those of variola in smears from the mouth and genital lesions, but this has not been confirmed. Fiegenbaum and Kornibleuth grew *Staph. aureus* from the blood and aqueous humour, and their case cleared up on systemic penicillin, but no follow-up is given. Katzenellenbogen, considering there was a resemblance to herpes, treated his cases with multiple vaccinations and after 10 months the symptoms became less marked, but this may well have been the usual cyclical variation in the disease. Syphilis, tuberculosis and lymphogranuloma venereum have all been excluded. Lorandos says the Greeks compare it to periodic ophthalmia of horses but this condition appears to be confined to the eyes. The published literature suggests a relationship to the Mediterranean as most of the cases have been reported from Turkey, Greece and Palestine (both Jew and Arab). Curth's case from the United States was of Italian parentage. O'Donnell's case from Australia was a Greek and ours had spent four years in North Africa.

Prosser Thomas found the pathology of the skin lesions to be primarily a venous thrombosis, and Berlin describes thrombosed vessels in the

genital lesions but does not state whether these were arteries or veins.

No form of treatment has been effective. Removal of focal sepsis, exhibition of sulfonamides, penicillin, stovarsol, arseno-benzene derivatives, various vitamins and multiple vaccination have all been tried. Anti-histamine drugs have been suggested by Whitwell owing to the unusual sensitivity of the skin.

The following appears to be the first fatal case reported from Great Britain.

A single man of 26, a baker's assistant, was admitted to hospital in August, 1947, because of uselessness of the left leg. As a child he had had only measles and there was no family history of any disease. He had served for four years in the R.A.F. in Egypt, during which time he had reported sick only for "Jippy tummy" and one attack of acute tonsillitis.

However, while in Egypt he began to complain of listlessness, sickly feelings and recurrent attacks of lumps on his legs, usually over the extensor surfaces. They appeared suddenly overnight, were red, raised and painful, lasted 2 to 3 days and tended to take on a purplish hue as they faded. Later similar lumps appeared on the eyelids and he developed recurrent swellings of the interphalangeal joints of each thumb. Still later he noticed ulcers in his mouth. These appeared suddenly, were very painful, lasted 3 to 5 days, and occurred at about monthly intervals. While they were present he felt slightly feverish and sick but never had any abdominal pain or vomiting. He was discharged A1 from the R.A.F. during a remission about a year before admission to hospital. During this year the skin and mouth lesions had continued to appear.

Three months before admission he noticed his right eye was bloodshot and the vision hazy. It was not painful and after a week cleared up completely. Two weeks later he had an attack of his skin lesions with nausea and vomiting. On the third day, frontal headache developed and the whole right side felt suddenly cold. This lasted 4 days. Eleven days before admission he noticed, on getting up, that his left leg felt heavy and that he was unable to bend the knee. His eyelids and thumb joints became swollen. For a month he noticed he was having heavy night sweats, precipitancy of micturition and that his legs and feet would bear much hotter water than his hands.

Examination at this time revealed a thrombosed, superior temporal branch of the right retinal vein with vitreous opacities (Mr. J. S. Arkle), an absent left lower abdominal reflex and pyramidal signs in the left leg with normal sensation. The other systems were normal. X-rays of the skull and chest were normal, and of soft tissue showed no evidence of cysticercosis. His Hb. was 96%, white blood cells 11,600 and blood Wassermann was negative. Blood culture grew *Staph. aureus.* The cerebrospinal fluid was clear and colourless with a protein content of 15 mgm. %; cells 25/c.mm. Wassermann negative. Culture sterile.

The next day he developed a right third nerve palsy; and, a week later, a right fourth nerve paralysis and a little fever which came down while he was on penicillin but recurred in spite of continued penicillin. He next developed a left superior rectus palsy, and was then transferred to the neurosurgical unit where he was found to have nystagmus in all directions. A week later inability to differentiate between heat and cold over both legs, with loss of touch sensation over a small area on the left foot, appeared; and at the same time a single erythema nodosum-like lesion developed above the medial epicondyle of the left humerus. No oral lesions were seen at this time. A right internal carotid angiogram done at this time showed no abnormality. The sedimentation rate was 4 mm. in 1 hr. (Westergren); Hb. 14.4 gr. %; white blood cells 19,000; neutrophils, 77%; lymphocytes, 16.5%; monocytes, 6%; eosinophils, 0.5%. The blood Wassermann was negative. Blood culture was sterile. Urine; normal with no evidence of schistosomiasis. The cerebrospinal fluid was again clear and colourless, 4 lymphocytes/cm.; sugar 75%; chlorides 720 mgm. %; protein 15 mgm. %; Lange normal; Wassermann negative. A swab from mouth lesions grew a pure growth of *Strep. viridans.*

He was discharged in October, 1947, with his nystagmus gone, left eye movements full and those of the right improving; but the pyramidal signs and sensory loss persisted. While at home his bouts of fever, accompanied by the skin and mouth lesions, persisted; and his right eye became red and painful. During one of these bouts he had pain at the tip of the glans penis at the end of micturition, suggesting trigonal ulceration.

In December, 1947, he was readmitted. Examination now revealed a partial right third nerve palsy with a dilated non-reacting pupil and marked vitreous opacities. There was gross circumcorneal infection, a muddy iris with no increase of introcular tension. The left eye was normal with full movements. No nystagmus was present. A Brown-Séquard syndrome was present below L. 1 dermatome, the pyramidal signs being on the left side. He had a short pyrexia during which ulcers appeared on the tongue and the buccal mucosa. These had a red margin, sharp edge, a bright yellow sloughing base and were very tender: they healed in about a week, leaving a thick palpable scar covered by apparently normal mucosa. A month later, during another febrile attack, numerous painless ulcers appeared on the scrotum and penis. These had a sharply defined edge, a yellow base which became covered by a black scab and healed leaving no scar. He was not aware of these until they were pointed out, and then he remembered a similar attack six months before. Three days later his most extensive outbreak or erythema nodosum developed.

The right iritis continued off and on and the left eye became similarly affected. On February 10, 1948, he developed a high fever (101.2 F.), a throbbing occipital headache, and vomited several times. Twitching of the left side of his forehead, marked phasic nystagmus to the left and a positive Kernig's sign were present. Lumbar puncture showed a hazy, colourless fluid under normal pressure. Cells, 763/cm.; neutrophils, 72%; lymphocytes, 28%; protein, 70 mgm. %; chlorides, 740 mgm. %. The next day fresh oral ulcers and an effusion into the left knee joint developed. A left seventh nerve paresis was present and by noon paralysis of conjugate ocular deviation to the left had appeared. On the following day he complained of difficulty in swallowing and towards nightfall began to vomit coffee-ground material. By morning he was unable to swallow anything, his speech was unintelligible, he had diminution of sensation in the mandibular division of the right trigeminal nerve, complete ocular fixation; and that afternoon he died of respiratory centre paralysis after an illness of just under two years' duration.

In this last exacerbation, investigations showed: bleeding time 2½ min. (normal, 1 to 3); clotting time 7 min. (normal, 2 to 8); prothrombin time 33 seconds (normal, 28 to 32); white blood cells 13,860, neutrophils, 95%, lymphocytes 3.5%, monocytes 1.5%, platelets 290,000. Urine normal. Blood culture sterile. Gram-negative diplococci were grown from the mouth lesions. No tendency to pustulation was noted on skin puncture at this or any other time. Unfortunately, permission for post mortem was refused.

It would appear that this unfortunate man ran almost the full gamut of this disease after having followed the usual course in the early stages. The events of the last three days were ascribed to a spreading brain stem thrombosis

and the hæmatemesis to acute ulceration of the gastric mucosa.

I wish to thank Professor F. J. Nattrass, F.R.C.P.; and Mr. G. F. Rowbotham, F.R.C.S., under whose care this patient was; and Dr. F. M. R. Walshe, F.R.C.P., for their help and encouragement, and Mr. J. S. Arkle, F.R.C.S., for permission to use his report on the fundus appearances.

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SPECIAL ARTICLES

SICKNESS SURVEY

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The health surveys which are conducted in the Provinces would not be complete if they were not accompanied by some information dealing with morbidity statistics. Realizing this shortcoming, the Department of National Health and Welfare, in co-operation with the Dominion Bureau of Statistics (acting after consultation with the Dominion Council of Health), has undertaken the preparation for a sickness survey to be carried out in the Provinces.

This survey has two separate and distinct purposes: (1) To provide the Provinces with information to be used in planning the extension and improvement of public health services and facilities, as well as to obtain background material of significance in the preparation of medical care and hospitalization prepayment plans. (2) The survey is conceived as an encouragement to public health authorities in the Provinces to continue and develop studies of this nature as part of their over-all health programs, and as part of the regular activities of local health authorities.

In view of the double purpose of the survey, information is being sought with respect to: (1) General data covering environmental factors; such as, living accommodation, means of preserving food, type of heating, kind of drinking water, etc. (2) Sickness of individuals. (3) Actual payments made on health care, hospitalization, special services, drugs, appliances, etc.

On the basis of actual experience obtained in the United States, and particularly in Great Britain, it has been decided to carry out the survey on the basis of a scientifically devised sample. The size of the sample was determined by the purposes of the survey, as well as by financial limitations. In order to augment the reliability of the collected data, without considerable increase in cost, it has been decided to group the three eastern Provinces of Prince Edward Island, Nova Scotia and New Brunswick as one Maritime region, and the three Prairie Provinces as one Prairie region. The remaining Provinces, due to their size, or to their specific problems, were considered as separate entities.

After considerable study of comparable undertakings, and due to lack of additional health personnel, it has been decided to use lay enumerators as collectors of information. It has been realized that the information collected would not possess full epidemiological validity, and that all that could be gathered would be information related by a lay informant—usually a housewife—to a lay enumerator during twelve monthly visits to the family.

This approach was considered as the only one feasible; a sickness survey carried out with the assistance of physicians would be a partial survey only, as only a portion of the illness occurring comes to the doctor's attention. For planning purposes, therefore, it is, perhaps, more important to obtain the total volume of illness—no matter how ill-defined—instead of having just this portion of illness recorded which was attended to by physicians.

Information obtained will be within a margin (sometimes substantial) of error. However, it should provide information with respect to the general population which would be very much better than the unrelated bits of information available now.

The statistics obtained in the survey will provide a basis for Provincial and National estimates of two types: (*a*) measures of volume; (*b*) incidence and prevalence of different kinds of sickness.

With respect to the measures of volume, it will be possible to make provincial and national estimates concerning:

(1) The amount of sickness in Canada; (2) The extent of disability; (3) The amount of medical care and other types of health care received for this amount of sickness; (4) The total volume of dental care; (5) Some indication as to the volume of preventive services carried out by physicians in private practice; (6) Expenditures for various types of health care; (7) Some indication as to the volume of unmet health needs throughout the country.

With respect to incidence and prevalence of different kinds of illness, it will be possible to make reliable estimates concerning the rates

of diseases which occur more than two per hundred during one year. On the basis of the results of similar studies carried out elsewhere, it is anticipated that data should be available for:

Respiratory diseases; digestive diseases; accidental injuries; degenerative diseases; communicable diseases; female genital and puerperal diseases; skin diseases.

As has been stated above, with the possible exception of one Province, information will be gathered by lay enumerators who will be instructed to record on the questionnaires exactly what has been related to them by the informant. In some cases, however, it is possible that the individual interviewed may be reluctant to give any information without the consent of his own physician. The co-operation by the medical profession in this respect, as well as their leadership in their respective areas, will be undoubtedly one of the factors which can substantially contribute to the validity of information gathered, and to the usefulness of the survey as a whole.

It should be mentioned that secrecy of the data collected is fully safeguarded. All names will reach the enumeration cards only, and will disappear in the course of further processing, being merged in the mass of objective and anonymous statistical data.

TOTAL REHABILITATION AND ORGANIZED MEDICINE*

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During the past ten years there has been a definite swing of world philosophy towards social security for all. This has increased the demand for social services, and medicine, as one of these, is bound to feel acutely this demand in its fields of activity.

Sometimes I think that the technology of our profession has far exceeded our philosophy. We have created several problems of great magnitude in the world populations and unless we can solve them, or take the lead in seeking a solution, we must expect some other agency to take this leadership from us. We have increased the span of life. Our populations are growing older. The working and earning breadwinners have now the burden of the care of the increasing aged, as well as the time honoured responsibilities toward the generation growing up.

This burden of the working population is further increased by the toll taken in the young by the crippling and chronic diseases. This is an age of machines and with each turn of a wheel someone is hurt. The prolonged loss of working time from trauma is well known among those paying the welfare cheques to these poor people so afflicted.

One can only hope that the departments of Health, Welfare and Labour of our Dominion and Provincial Governments will view these problems and be forced by public demand to seek a solution. The people must be served!

From the viewpoint of Government, Health is divided into three aspects: (1) Preventive medicine. (2) Curative medicine. (3) Rehabilitation.

Preventive medicine.—At the present time, the preventive field of Health is largely run by Government agencies and Departments of Health.

Curative medicine.—The practice of medicine is, in Canada still in our own hands, so that the curative field is under our own direction. It has not been the short term or acute illness that has so shaken the core of organized medicine throughout the world, so much as it is the prolonged illness and incurable disease.

Rehabilitation.—Rehabilitation has included, in the past, convalescence, re-education, retraining and replacement in gainful employment. Where none of these are successful in the management of a specific case under present conditions, the Welfare Departments and local municipal charities take over to do what they can to keep the poor unfortunate and his family alive. This has proved a tremendously costly business, with no possible gain to the community, but an ever-increasing burden to the already heavily taxed worker.

Many of the less serious prolonged minor disabilities we doctors have neglected or ignored, and have thereby fostered in society the irregular practitioner. This has bred a measure of malcontent among some of the lay population.

Of the incurable crippling diseases, as we can perform no miracle cure we have assured ourselves of the diagnosis and discharged our patients from hospital to his community. There, as there is nothing further for him, he has had to rely on charity or municipal aid.

Our consciences were clear. There were sociologists and welfare agencies. The psychiatrist was called in for those requiring him and the government could take certain of these unfortunates into their hospitals, if they proved to be unable or unwilling to quietly exist in the community, or adjust themselves to their plight.

These problems were not our job. We were too busy looking after those we could cure. We looked on each new case from the viewpoint of the diseased organ or part and neglected to consider the man and his nervous control mechanisms. Our philosophy in treatment was that of curing the part and not of treating the whole being.

* Address to The Canadian Medical Association Executive Committee, November 29, 1949.

Sister Kenney brought part of this to light in her management of poliomyelitis: re-education of the remaining undamaged or recovering neuromuscular mechanisms before their cerebral control was irremedially lost. How this is best done remains controversial.

There are those among us who looked upon the efforts of physiotherapists and occupational therapists as unnecessary and their work as nonsense. There was some justification in this attitude as our best motivated patients got well from their disability or learned to live with it without such aid. But is this true of all our cases?

Society must consider all people, not just the best people. The government at its various levels, and charity, have done what they could.

It has become evident that the government has been doing more and more for the care of the crippled incurable, so why not let them do it to all?

The great field of rehabilitation has sprung into prominence, fostered by the government and by commissions, such as the Workmen's Compensation Boards. Why? Something had to be done to retrain, re-educate and re-establish the tremendous number of people injured and disabled in industry and the armed services. It saved money; it earned money by making taxpayers out of those consuming a large portion of the total tax income to the community.

What about the civilian not covered by D.V.A. or Workmen's Compensation? Was he blind? There was a service supplying complete rehabilitation. Had he T.B.? We had sanatoria. But if trauma is the cause, or a street accident, there is no service. Yet this is a machine age! Only 1/5 of the crippled are provided for by existing services.

What is total rehabilitation? It is defined as the process of assisting the disabled to attain the optimal physical, mental, social, economic and vocational adjustment and usefulness of which he is capable.

This definition is applied from the individual's standpoint, and does not refer to any particular field of activity, be it surgical, medical, psychiatric or vocational training. This may mean the use of all or none of these services in the individual case. It will be noted that medicine and surgery are included under the physical aspect of the definition.

There are in this country approximately 15,000 seriously disabled persons annually who require rehabilitation without considering the geriatric problem.

A study was made from a good rehabilitation program in the United States of a fixed group of disabled; 75% of these were unemployed before they were rehabilitated and 16% had never been employed before. Of the thousands that were re-established, the average annual income rose 400%, as the direct result of their rehabilitation program. This meant payment of income tax in a higher amount to the country.

You may well ask, "What has this to do with me?"

Total rehabilitation represents an extension of treatment of our patients, and helps solve the psychogenic disturbances, with the resulting unemployable, difficult-to-manage individual case. It should start, experience has shown, with the diagnosis.

The attitude of some in viewing the possibilities of setting up such services is as follows: I quote from a brief on the problem to the Federal Government:

> "An organizational environment must be provided within which the co-operation can be made effective, in terms of developing and carrying out a unified plan, which will insure the rehabilitation of the individual case."

From the point of view of those in favour of National Health insurance, this organizational environment should be the Federal Government's Department of Health and Welfare.

We are responsible for the physical and mental aspects of total rehabilitation and can do more than anybody to take a strong lead in this popularly demanded and required service.

I cannot believe that most of the short term and acute curable surgical or medical conditions seriously require government control. In fact it would be hazardously expensive as in the case with the British scheme. The service of prepaid medical care sponsored privately and by the O.M.A., and now being pushed by our C.M.A. on a national basis should cover this aspect well. Unless, however, we take the lead in the management of the long term and incurable case, by showing the way in total rehabilitation we are apt to be encroached upon via the back door.

What can we do? I have asked myself this question many times, as I endeavoured to replace in society severely disfigured and disabled men from this war and now am faced with the almost impossible situation in our civilian cases.

The whole D.V.A. program could not function to re-establish them unless the doctor directed the way. What can the man do physically? What about the mental problem? What can we teach him to do? These questions have to be answered by the doctor.

One feels we must first have trained personnel in our civilian hospitals; the nurse, the physiotherapist, the occupational therapist, one following, overlapping and augmenting the treatment of her predecessor. These people

are in alarmingly short supply. More training schools are required. The government hospitals pay more, have greater security for their help, and have a good supply of personnel, yet train none to fill the great need. We must foster the institution of schools across the Dominion to train physiotherapists, occupational therapists, and men from our own ranks to direct and teach. We must establish in our hospitals and communities rehabilitation centres, however small; enlist the aid of our local welfare workers and Department of Labour rehabilitation officers and give them greater scope in their efforts.

Many individual associations and societies are springing up for the management of such diseases as arthritis, paraplegia, cerebral palsy and so on; but these so far, are alone in their efforts, with the backing of but a few of the doctors. These societies should be given our support and direction, in integrating the specialized medical services required for their cases.

We must educate our students and interns to realize that their responsibilities do not cease with the discharge of a patient from their office or hospital, and that rehabilitation begins with them and their diagnosis.

It has been shown that properly prepared and placed disabled can become efficient workers. Through the positive approach to rehabilitation, it is inexpensive to the community in the long run, as it pays for itself indirectly.

If a nationalized health scheme must come, let it be directed toward the greatest need, the most economic, and in fact, the most profitable plan—the care of the disabled and incurable. Let it teach people who may become, or are charges of the state, to help support the state themselves and be happy and self-sufficient with their disability.

Total rehabilitation is no one's responsibility at the moment. If we do not take the lead in this aspect, I have been informed, we may expect that a government agency will! Let us capitalize on the present great interest in rehabilitation that it be accurately apportioned in the best interests of all.

CANCER OF THE RECTUM.—Twenty-five per cent of cancers of the rectum are treated for rectal conditions other than cancer.

Remember that a change in bowel habit and/or rectal bleeding are the cardinal symptoms of cancer of the rectum. Eighty per cent of patients with rectal cancer complain of these two symptoms.

Digital and proctoscopic examinations will discover rectal cancer. A change in bowel habit may be noted in constipation, diarrhœa, or change in the size or shape of the stool.

Patients fear a rectal examination. Physicians dislike to make them. The result is late diagnosis, inoperable cancer when finally recognized, embarrassment to the physician and untimely and unnecessary death of the patient.—[From *The Acuff Clinic Bulletin.*]

CLINICAL and LABORATORY NOTES

MACROSCOPIC EXAMINATION OF THE PLACENTA*

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The purpose of this paper is to present the method of placental examination used in the laboratory. It can easily be applied in the case room.

Clinical history.—The physician performing the delivery knows all the important facts regarding the clinical history. These are: the mother's age, parity, gravidity, expected date of confinement, and the actual gestation age in weeks. Were there any abnormal deviations during the pre-natal period? Was labour spontaneous or induced? What was the duration of labour in hours, and the length of time that the membranes were ruptured? What is the child's weight in grams? Is it term, premature, alive, still-born, or macerated? Were there any complications? If so, what therapy was given?

Gross examination.—Examine the placenta according to a definite plan: as for example, the membranes, cord, placental weight and dimensions, fetal surface, maternal surface, and cut surface.

1. *Membranes.*—Are the membranes complete or incomplete? A complete collapsed sac with a rent over the cervical area signifies that none has been retained. Where is the location of the point of rupture and what is its diameter in centimetres? Do the amnion and chorion show any discoloration, meconium or any pathological change? Passage of meconium may indicate fetal distress.

2. *Cord.*—What is the length of the cord? Is it attached centrally, eccentrically, marginally or over the membranes? Are there any torsions, knots, or loops? These do not cause fetal death unless they can be demonstrated to occlude the circulation for a prolonged interval. Does the cord show tumours or varices? Is œdema present?

3. *Weight and dimensions.*—Weigh the placenta without cord and membranes. Record the dimensions of the fetal surface and the thickness. The placenta is normally one-sixth or one-seventh the weight of the fetus. Hy-

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Abstract from studies on the placenta, on material kindly supplied by the Department of Obstetrics and Gynæcology.

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dropic placentæ must be weighed as soon as possible to prevent loss of weight through drainage of œdema fluid. They are usually considerably increased in weight.

4. *Fetal surface.*—Describe the fetal surface, which is called the chorionic plate. What is its shape and vascular pattern? Note any abnormalities of form, size and development. There may be multiple placentæ in single pregnancies, accessory placentæ, and placentæ in multiple pregnancies. The abnormalities of development are circumvallata, membranacea and accreta placentæ.

The circumvallate or circumcrescent is the commonest of the three. Normally the fetal surface is directly and entirely covered by chorion. In the circumvallate type the fetal surface is directly covered by decidua over the entire perimeter or a portion thereof. The membranes cover the decidua, forming a double layer at the inner margin. Vessels on the fetal surface stop short at this inner margin and there they dip into the parenchyma of the placenta. The circumvallate placenta tends to separate prematurely. It is associated with abortion and premature labour.

Membranacea and accreta types of placentæ are rarely encountered.

Does the fetal surface show chorionic cysts, fibrin deposition or tumours? If so, what is their location and size in centimetres? What is the vascular pattern and distribution? Do the vessels spread out like a spider (disperse pattern) or like a fork (magistral type), or are they distributed asymmetrically? Is there a communicating branch between the two umbilical arteries near the insertion of the cord upon the placenta? Veins lie deeper than arteries on the fetal surface of the placenta. Do the vessels show any rupture or thrombosis? Do any of the vessels extend right to the edge of the placenta? The vessels on the fetal aspect stop short five or more millimetres before reaching the circumference and dip into the placenta. *If the vessel runs to the edge, carefully examine for accessory placentæ. A retained portion of placenta may produce a severe post partum hæmorrhage.*

5. *Maternal surface.*—Examine the maternal surface. Count the number of cotyledons. Normally there are fifteen to twenty. Is the fissuring between cotyledons normal or prominent? Are the cotyledons nodular as in hydrops? Are there any decidual changes, calcium plaques or any excavations or depressions?

6. *Cut surface.*—Serial section the placenta and examine the cut surface. Is the colour deep red or abnormally pale? Normally, there is no resistance to section, but it may be found in hydrops. Are there any pathological changes indicating acute or chronic inflammation, calcification, degeneration in the septa, immaturity for the period of gestation, tumours, or vascular disturbances? The tumours may be chorioangioma, hydatidiform change or a malignant primary or secondary process. Does the placenta show evidence of acute hæmorrhage, very small size, or widespread "infarction," each of which may result in circulatory embarrassment. If a lesion is present, describe its size in centimetres, location, colour and appearance.

Infarction, as applied to the placenta, is actually ischæmic necrosis of villi. This may be due to fibrin deposition upon the villi with or without intervillous thrombosis. Damage to the placental maternal arterioles also produces ischæmic necrosis of villi. Macroscopically the appearance of these lesions depends upon their age. If recent, the area may be purple and soft. In older lesions the colour changes to brown, then to white. The cut surface becomes firm. Intervillous thrombosis is laminated in appearance. Large areas of subchorionic fibrin deposition are frequently present. Such deposits are pale yellow to white in colour. They are of no clinical significance unless they interfere with the placental circulation. "Infarction" of two-thirds of the placenta has been reported with no evident effect upon the fetus, but any "infarction" involving more than one-quarter of the placenta requires further investigation.

In concealed or revealed accidental hæmorrhage, areas of indentation may be present on the maternal surface. This is produced by pressure from the large blood clots.

SUMMARY

A systematic examination of the placenta is described. The membranes, cord, weight and dimensions, fetal, maternal and cut surfaces are treated in sequence.

Among the commoner abnormalities which may be of practical importance are:

1. Incomplete membranes are indicated when the rent overlying the cervical os cannot be closed without leaving a defect.

2. "Infarction" involving more than one-quarter of the placenta should receive further investigation. White plaques on the fetal surface indicate fibrin deposition and are not clinically significant unless interfering with the circulation.

3. Vessels running right to the edge of the placenta may indicate retained portions.

4. Knots, torsions and loops around the fetus do not cause fetal death unless they definitely occlude the circulation for a period of time.

5. Ratio of placental weight to that of fetus considerably above or below 1:7.

6. Retained complete or partial cotyledons.

TRICHLORETHYLENE—THE McGILL VAPORIZER

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The object of this paper is to discuss the technical features of the administration of trichlorethylene and to introduce the McGill vaporizer, which has been designed by one of us (E.A.). Detailed clinical accounts of this anæsthetic have already appeared.[1, 7]

The first apparatus to be designed for the use of trichlorethylene and atmospheric air was that by Marrett in 1942.[8] It consisted of two wide bore inhalers in series with a non-return fibre valve fitted on to one end. One vaporizer was for ether and the other for trichlorethylene. Following this, various types of vaporizers were made,[9] many of which were designed for acceptance by the Royal College of Gynæcologists and Obstetricians of England,[10] for use by midwives in domiciliary obstetrics. These were so designed as to deliver a constant analgesic percentage of vapour under all conditions. The use of such vaporizers is very limited, especially when, as most physicians agree, very few patients react exactly the same way to any given drug. Therefore, all vaporizers should be capable of variation to suit the individual needs of each type of patient.

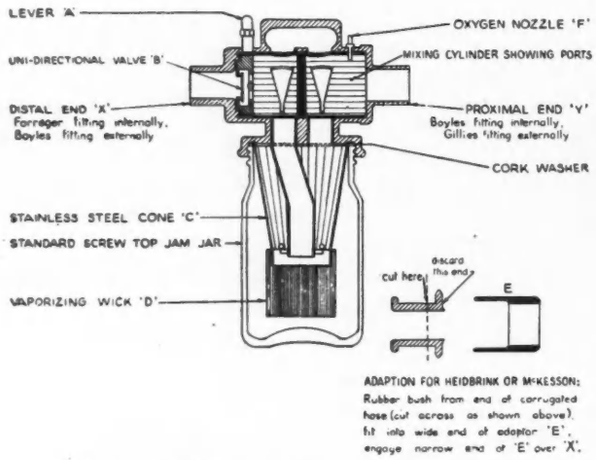

Fig. 1.—McGill vaporizer. Schematic view.

The body of the McGill vaporizer (Fig. 1) consists of a non-ferrous casting with two projecting ends. The inspiratory end, (X) is designed to fit internally the Forreger and externally the Boyles or Coxeter anæsthetic machine, and with the metal adaptor supplied plus a rubber bush from the end of a corrugated rubber hose, to fit the Heidbrink or McKesson. The other end (Y) has the Boyles fitting internally and a Gillies fitting externally, thus allowing two or more vaporizers to be joined in series. The metal adaptor also fits over this end which becomes an easily detachable hose mount. Attached to the body of the vaporizer is a stout metal clamp, lined with felt surfaces. There is also an inlet nozzle (F) with a Schrader tyre valve for admission of oxygen. This nozzle admits oxygen on the patient's side of the vaporizer, so that if oxygen is required it will not be charged with anæsthetic vapour.

The base of the body is threaded to take a standard screw top glass jar of 8 or 12 oz. capacity. Attached to the base is a stainless steel cone (E) to the base of which is fitted an easily detachable wick (D).

Inside the body is a stainless steel cylinder with two twin sets of ports so designed that there is a steady gradual increase in vapour strength yet the cross diameter of the ports in any position is constant, this insures against any increase in resistance to respiration whatever concentration of vapour is used. Incorporated in this cylinder is a floating unidirectional valve (B) which, by its mode of construction can never become "stuck" in the open position so allowing excess carbon dioxide to build up when the vaporizer is used on the "draw over" principle, irrespective of the position of the vaporizer. If this valve is not required, it can be removed by first unscrewing the small grub screw in mount (Y) and then unscrewing mount (Y). Lever (A) is then unscrewed in an anti-clockwise direction allowing the inner cylinder to be withdrawn. The screw disc holding the valve in position is next removed with the special key provided which allows the valve to be freed.

Fig. 2

Bearing in mind the great analgesic properties of trichlorethylene and its value in enhancing nitrous oxide anæsthesia, its uses become apparent. Any apparatus designed for its use, therefore, should be simple, portable and capable of being used with a gas machine.

Owing to the inadvisability of allowing the vapour[11, 12] to come in contact with soda lime, the trichlorethylene can be placed in the vaporizing jar of a partial rebreathing circuit, or in a vaporizer such as that produced by us, adaptable for the use with a gas machine, avoiding the absorber circuit. If the ether jar of an absorber circuit is used, care must be taken to cleanse the bottle and wick thoroughly before subsequent use over soda lime.

Using atmospheric air as the vehicle for vaporization, the concentration yielded should be constant at any setting with any constant inflow of air. The McGill vaporizer delivers 3.05% trichlorethylene vapour with the wick in place, the control lever at maximum concentration and a litre flow of 10 litres per minute as shown by minute by minute analysis for 45 minutes. Rebreathing is prevented and stability of delivery

is facilitated by the metallic non-return valve riding on a nipple (see diagram). The concentrations must be capable of being gently graded, this being obtained in the McGill vaporizer by virtue of the shape of the ports.

It has been found that a vaporizer capable of only producing analgesia is not entirely satisfactory, though it has some advantages. The McGill vaporizer will deliver either analgesic or anæsthetic concentrations. Any fixed concentration either analgesic or anæsthetic can be obtained by removing the lever control at any specific position.

On occasion, it is necessary to give oxygen to a patient by a mask. It is considered that every vaporizer should be designed to permit this.

Resistance to respiration should be minimal. In the vaporizer described at a flow of 20 litres per minute, there is a resistance of 1.2 cm. of water while the minimal cross-sectional area is 1.9 sq. cm.

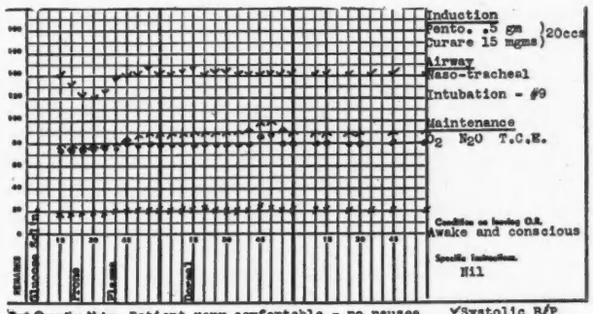

Fig. 3.—Section of chart of patient undergoing a three hour plastic procedure.

The McGill vaporizer, in which the central cone acts as a non-spillable device, can be adapted for use with other volatile agents; while two vaporizers, as has been described before, may be connected together in order to use two agents in series.

In addition to the advantages of lightness (3 lb.), compactness (7″ x 5″) and portability, the apparatus can be clamped to a table, bed or anæsthetic cabinet. When connected to a gas machine, a rubber bag to allow for tidal air must be incorporated in the circuit. This can act as a rebreathing bag in the case of partial rebreathing or a reservoir if no rebreathing is desired.

For practicability, standard glass jars, cork washers and corks are used, so that delay in replacement is minimal, in case of breakage.

Although trichlorethylene has been used by us in a wide variety of cases, we find its greatest value, with air as the vehicle, in the field of obstetrics and in minimal concentration as an adjunct to nitrous oxide in various surgical procedures. In the former instance, 2,000 deliveries have been carried out by us, while in the latter it is frequently used from choice for lengthy orthopædic and plastic operations as well as many others. In surgical cases following the induction of anæsthesia by pentothal or by pentothal and curare, it is found that complications are rarely if ever observed.

Method of use.—Pour not more than 2 oz. of trichlorethylene into the bottle through the filler hole and replace the cork. Attach corrugated tubing, expiratory valve and face or nasal mask. The vaporizer is now ready for use. The mask must be one to give a perfect fit.

Recommended settings.—Using the vaporizer with air as the vehicle, it is suggested that the setting for the control lever for intermittent analgesia be from 5 to 7 notches. (Up to 1.5%). If anæsthesia is desired, the same concentration may be used for induction but as soon as the first stage is reached the concentration should be reduced to that sufficient to maintain a suitable level.

For maintenance of anæsthesia when used with nitrous oxide and oxygen mixture, the setting should be 1 to 3 notches (up to 0.4%).

Acknowledgment is made to the Canadian Car and Foundry Company Limited for their invaluable aid in the designing and production of the vaporizer. Also, to the Dominion Glass Company Limited of Canada for their advice in the selection of the universal glass jar. Acknowledgment is made too for the work carried out by the National Research Council in establishing the fact that the vaporizer does produce a constant concentration of vapour at a constant flow and that this concentration is 3.05% at a flow of 10 litres per minute. The National Research Council has also kindly undertaken to analyze the delivery of vapour at various settings of the control lever with the detachable wick in position and without the use of the wick.

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NEW INSULIN PRODUCTION METHOD.—An increased production of insulin is expected to result from research now being undertaken at the Massachusetts Institute of Technology in the United States. Dr. D. F. Waugh, of the institute's biology department, has succeeded in short-cutting the process of purifying insulin, one of the most difficult steps in its manufacture. He has discovered that, under certain conditions, insulin molecules tend to unite into tiny particles in which they themselves exclude any other compounds. In other words, the insulin purifies itself. M.I.T. now is conducting further tests on the process, which, it is believed, may be applied to the manufacture of other drugs.—(UNESCO.)

THE CANADIAN MEDICAL ASSOCIATION

Editorial Offices—3640 University Street, Montreal

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EDITORIAL

PLEURAL SHOCK

PLEURAL shock is a term which has long been applied to those symptoms which occasionally follow pleural puncture, that is, during thoracentesis or during the induction or refilling of an artificial pneumothorax. Such symptoms include visual disturbances, Jacksonian contractures followed by weakness of the muscles most affected, unconsciousness followed by headache on recovery, transient or permanent mono- or hemiplegia, and occasionally these reactions are fatal. Roger first described pleural shock in 1864. While he was washing out a chronic empyema cavity with an antiseptic, the patient, a child of 8 years, fell back unconscious, with clonic contractions of arms and legs, but recovered after an hour. Roger attributed the symptoms to reflex action from stimulation of nerve fibres in the pleura, and this theory was generally accepted until careful post-mortem examinations in fatal cases of pleural shock began to reveal that embolism to cerebral and/or coronary vessels was the apparent cause of death. Also, pleural shock occurs in cases in which the pleura has been anæsthetized with local anæsthesia, presumably reducing mechanical stimulation of the pleura. Recently Morland[1] has reviewed the literature on pleural shock, summarizing the theories and experimental work regarding causation, and cites five cases, one of them fatal, in which pleural shock occurred during thoracentesis, local anæsthesia having been employed in all five instances. He states that he was able to collect only these five cases during the past 25 years, and estimates that in his experience, serious reactions following puncture of the pleura occurs only once in 10,000 cases.

Morland feels that the term pleural shock should be dropped, since there is no evidence that mechanical or chemical stimulation of sensory nerves in the pleura is any more likely to produce serious or fatal accidents than similar trauma in other parts of the body. As a result of his experience, Morland concludes that provided an adequate collapse of the lung has already been obtained, there is no reason to believe that local anæsthesia increases the safety of a pneumothorax refill. Air embolism, either cerebral or coronary, is the commonest cause of accidents accompanying refills. The evidence suggests that serious accidents during the aspiration of fluid are due to disturbance of the heart from reduction of intrathoracic pressure. Such accidents are most likely to happen where the pleura is thickened and inelastic. It is therefore important to avoid very low pressures during aspiration or replacement of fluid.

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EDITORIAL COMMENTS

Mobile Physiotherapy Units

The treatment of active rheumatoid arthritis should be considered as a whole, if we are to use our resources to the best advantage. Dr. Dean Robinson of Banff has pointed out that there is a tendency in some quarters to concentrate on the development of mobile physiotherapy units. These no doubt have their place, but in the wide view hospital beds provide for greater advantages. Rheumatoid arthritis is a constitutional disease, and its treatment begins with rest in bed, whilst medication with aspirin, iron and vitamins is necessary. Treatment with gold preparations is frequently given, and the safest place to do this is in a hospital. Sedimentation rates should be done to follow the progress of the disease. Resting casts are frequently required. Warm mineral baths allow for freer joint movement at the right time, as well as re-education for walking. Physiotherapists should be in regular attendance to direct movements and to train and build up muscles. Occupational therapy is most useful in patients who cannot hope to return to their work; incidentally, many of these cases would not have reached such permanent disablement if they had been brought under treatment at an earlier stage.

The active rheumatoid arthritis case demands early and complete and continuous treatment, and it is only in specially equipped hospitals that this can be done. The part to be played by mobile physiotherapy units is chiefly in osteoarthritis, neuritis, fibrositis, and convalescing rheumatoid patients, and here no doubt they are very valuable. However, in treating the active rheumatoid arthritic, they must be considered at best as a stop-gap, until more hospital beds can be provided.

Laennec Medical

We note with great interest the publication of the first number of the *Laennec Medical*, a medical review published by the Medical Students

Association of Laval University. It speaks well for the vigour of the undergraduate life of Laval University, where expansion and new developments are in such evidence. The publication of a medical journal means hard work for someone, particularly in the ensuring of its continuity. This is well recognized by Mr. Roberge, the President of the Laval Students Association, and we can only wish the new venture every success. It has made a very good beginning.

Upper Gastro-intestinal Bleeding

Modern medicine demands team-work. An example of this is the management of upper gastro-intestinal hæmorrhage at the Boston City Hospital, where many such cases are encountered among chronic alcoholics. From previous examinations, and from history, physical examination, and laboratory examinations at the time of admission, bleeding from œsophageal varices is often suspected. However, accurate diagnosis is essential, because a patient with known cirrhosis of the liver and œsophageal varices can still be bleeding from the stomach or duodenum, in which case emergency gastric surgery may be indicated. Accordingly, it has been the practice at Boston City Hospital to œsophagoscope patients with upper gastro-intestinal bleeding. Recently a report[1] has appeared summarizing the management of 14 patients with upper gastro-intestinal bleeding. Such patients are admitted to the medical wards, and members of the thoracic surgery service performed the œsophagoscopy. Nine of these patients were examined endoscopically using preoperative sedation and topical anæsthesia while in bed on the ward because they were too ill for transfer to the operating room. Œsophageal varices were readily identified as blue, dilated, tortuous veins. When bleeding varices were found, oxycel-gauze tampons were introduced through the œsophagoscope for compression of the varices. The œsophagus was packed with 6 to 12 tampons beginning at the bleeding point and continuing upwards as the œsophagoscope was withdrawn slowly. This measure produced apparent arrest of actively bleeding varices in one patient in this series. Of the 14 patients with severe upper gastro-intestinal bleeding, endoscopy excluded the diagnosis of œsophageal varices in 7 patients with known or suspected cirrhosis of the liver. Emergency gastric surgery was subsequently performed on four of these patients. One patient who was considered for emergency gastric surgery was œsophagoscoped in the operating room under general anæsthesia because he failed to cooperate under local anæsthesia. When a normal œsophagus was found, the general anæsthetic was continued for the gastric resection. As a result of their experiences, Carter and Zamcheck conclude that œsophagoscopy contributes to the management of patients with massive gastro-intestinal bleeding by facilitating the prompt diagnosis of œsophageal varices in selected patients. Unwarranted gastric surgery may thereby be prevented. The early exclusion of varices in bleeding patients with known or suspected cirrhosis may expedite prompt operation when indicated. J.H.D.

1. CARTER, M. G. AND ZAMCHECK, N.: *New England J. Med.*, **242**: 280, 1950.

MEN and BOOKS

HENRI AMEDEE LAFLEUR

C. A. Peters, M.D.

Montreal, Que.

[*On November 13, 1949, a tablet in memory of Dr. Henri A. Lafleur, was unveiled by Dr. Charles A. Peters, a lifelong friend and colleague, at the Montreal General Hospital. The tablet was erected by the Lafleur Reporting Society of Montreal, a group composed of men drawn from every department of the hospital.*

A large gathering of the staff and friends of the hospital was present, and after the unveiling Dr. Peters gave the following address.—EDITOR.]

Dr. Lafleur was generously endowed with gifts of the heart and of the mind, and one of the most priceless was his ability to enthuse his younger colleagues and gain their admiration; and so in 1923 a number of them, recruited from practically every department of this hospital, banded themselves together to form the Lafleur Reporting Society. Dr. Lafleur was very sensible of this honour, as he knew that it was given to few men to have such a society formed during the lifetime of the individual so honoured. Usually such societies are formed "in memory of".

Dr. Lafleur became Patron of the Society and attended every meeting as long as he was able, and I have great pleasure in stating that this Society is as worth while as ever and will continue so for many years to come.

Dr. Lafleur's father was born in this Province and as a young man went to Europe and became a Baptist minister. He married there a young lady of Swiss French nationality. They had three sons and two daughters, and these three boys made the name of Lafleur one to conjure with in academic circles in Montreal. Eugene, the eldest, became Professor in the Law Faculty of McGill University and was one of the most distinguished, if not the most distinguished, member of the bar in this province. Paul became Professor in the Arts Faculty of McGill University and implanted his personality on many classes of students. Henri became Professor in the Medieal Faculty of McGill University and was one of Canada's leading diagnosticians.

Dr. Lafleur graduated in Arts and in Medicine at McGill and was then appointed house

physician to this hospital. Whilst he was here, Dr. Osler, who was then in Philadelphia, was called to Baltimore to be Professor of Medicine at the newly formed School at Johns Hopkins Hospital. Dr. Osler selected Dr. Lafleur to be his first resident physician. This must have given the young houseman a great thrill, as he knew that many brilliant young American doctors were available and anxious to get such a valued appointment. I fancy this association must have had a profound influence in shaping the future of the younger man. They were not a bit alike in looks; their personalities were entirely different; but in the realm of the mind there was very little to choose between them. They both became great teachers of Medicine and both had an unusual knowledge of and fondness for the Classics. The friendship commenced then ripened with the years until the passing of Sir William, and I like to think that the spirit of Osler is hovering above us this morning, as Dr. W. Francis, the nephew of Sir William, sent to the Society a donation "derived from royalties on Osler's *Æquanimitas*, because I knew he would, of course, want to chip in".

Dr. Lafleur returned to Montreal to start practice and he was soon appointed Out-patient Physician and later Physician to this hospital, and he and Dr. F. G. Finley carried on the great tradition in Medicine in this hospital for upwards of a quarter of a century. No private patient ever received more meticulous attention than was given by these two great clinicians to the public ward patients placed under their care.

It was an education to see Dr. Lafleur examine a patient. We often said he had a sixth sense which made him aware of any slight deviation from the normal, and we often wondered how he arrived so quickly at a so correct diagnosis. It was a common saying in the hospital in those days, and I would like to assure the President of the Hospital that I believe the same is true today, if you have an obscure medical ailment, enter a ward of the Montreal General Hospital.

I could speak at length of his personal qualities. I could tell you of his charming smile, his keen sense of humour, his caustic wit, his apt sayings when he was pleased, but still more apt if he were annoyed, his almost pathological dislike of noise, his mastery of detail, his insistence on the correct use of words, his fondness for good literature, his unusually retentive memory, which made it possible for him to recite poem after poem, his kindly courtesy to the sick poor, his love of the great outdoors —in his younger days sailing and in his later years fishing. I could go on, but I think I have said enough, except to tell you it was a great privilege to have been associated with such a man for so many years.

Program

EIGHTY-FIRST ANNUAL MEETING OF THE

Canadian Medical Association

In Conjunction with

THE NINETY-SEVENTH ANNUAL MEETING OF THE

Nova Scotia Division

TO BE HELD IN THE NOVA SCOTIAN HOTEL, HALIFAX JUNE 19, 20, 21, 22, 23, 1950

President—Dr. Jack F. C. Anderson, Saskatoon.
President-Elect—Dr. Norman H. Gosse, Halifax.
General Secretary—Dr. T. C. Routley, Toronto.
Assistant Secretary—Dr. A. D. Kelly, Toronto.
Local Hon. Secretary—Dr. C. M. Jones, Halifax.

Arrangements for the Eighty-first Annual Meeting to be held in Halifax during the week of June 19 are proceeding satisfactorily. General Council will meet on Monday and Tuesday, June 19 and 20. On Tuesday evening, the members of General Council and their wives will be dinner guests of the Nova Scotia Division. A series of Round Table Conferences has been arranged for the mornings of Wednesday, Thursday and Friday, from nine until ten-thirty o'clock, to be followed by General Sessions. Sectional Meetings will be held on Wednesday, Thursday and Friday afternoons. The Annual General Meeting will be held on Wednesday evening, June 21, commencing at 8.30 o'clock. On this occasion, the retiring President, Dr. Jack F. C. Anderson, will hand over the badge of office to his successor, Dr. Norman H. Gosse.

SCIENTIFIC PROGRAM

Wednesday, June 21

ROUND TABLE CONFERENCES

9.00 - 10.30 a.m.

Anæsthesia

Post-Anæsthesia Complications.
Dr. Ralph W. M. Ballem, Halifax (Chairman); Dr. Eric Howell, Truro; Dr. C. R. Stephen, Montreal; Surgeon Lieut. Commander H. Little, Halifax.

Ophthalmology

Glaucoma.
Dr. J. A. MacMillan, Montreal (Chairman); Dr. L. G. Holland, Halifax; Dr. H. J. Davidson, North Sydney; Dr. D. M. MacRae, Halifax.

Psychiatry

Treatment in Child Psychiatry.
Dr. F. A. Dunsworth, Halifax (Chairman); Dr. W. A. Hawke, Toronto; Dr. E. J. Rosen, Toronto.

Radiology

Radiation in the Treatment of Carcinoma of the Cervix.
Dr. Norman McCormick, Windsor, Ont. (Chairman); Dr. Herve Lacharité, Montreal; Dr. Ivan Smith, London; Dr. Jean Bouchard, Montreal; Dr. Clifford Ash, Toronto.

Surgery

The Early Diagnosis and Treatment of Carcinoma of the Stomach.
Dr. Alan Curry, Halifax (Chairman); Dr. Angus McLachlin, London; Dr. Gavin Miller, Montreal; Dr. James Reid, Halifax; Dr. S. R. Johnston, Halifax; Dr. Carl Stoddard, Halifax; Dr. J. H. Fodden, Halifax.

GENERAL SESSION

Wednesday, June 21

10.45 a.m.

Valedictory Address.
Dr. Jack F. C. Anderson, Saskatoon, President, Canadian Medical Association.

The Osler Oration: Cortisone and ACTH—Their Current Application to Medical Problems.
Dr. George W. Thorn, Boston, Mass.

Radiological Aspects of Gastric Ulcer.
Dr. Richard Schatzki, Boston, Mass.

SECTIONAL MEETINGS

Wednesday, June 21

2.15 p.m.

Anæsthesia

Atelectasis.
Dr. Carl Stoddard, Halifax.

New Anæsthetic Drugs.
Dr. Harold R. Griffith, Montreal.

Anæsthesia for Tonsillectomy and Adenoidectomy.
Dr. C. R. Stephen, Montreal.

Anæsthesia for Abdominal Surgery.
Dr. L. E. Prowse, Charlottetown.

Medicine

The Diagnosis and Treatment of Pneumonitis.
Dr. Gordon Lea, Charlottetown.

The Use of the Artificial Kidney in the Treatment of Shock Associated with Hepatic Failure.
Dr. George W. Thorn, Boston, Mass.

Death Caused by Bronchial Asthma.
Dr. C. H. A. Walton, Winnipeg.

Diseases and Disorders of the Small Intestine.
Dr. R. M. MacDonald, Halifax.

Obstetrics and Gynæcology

The Use of Blood and Plasma in Obstetric Hæmorrhage.
Dr. Joseph Tanzman, Saint John.

Newer Developments in Toxæmia of Pregnancy.
Dr. G. B. Maughan, Montreal.

The First Stage of Labour.
Dr. Ruvin Lyons, Winnipeg.

Ophthalmology and Otolaryngology

The Treatment of Detachment of the Retina.
Dr. H. M. Macrae, Toronto.

Exophthalmos due to Extra-orbital Lesions.
Dr. M. R. Marshall, Edmonton.

Facial Pain.
Dr. E. H. Botterell, Toronto.

Bronchoscopy in the Diagnosis and Treatment of Lung Disease.
Dr. E. E. Scharfe, Montreal.

Preventive Medicine

Tuberculosis Control and the Practising Physician.
Dr. C. J. W. Beckwith, Halifax.

Cancer as a Cause of Illness and of Death.
Dr. O. H. Warwick, Toronto.

The Practising Physician in the Control of Syphilis.
Dr. Basil Layton, Ottawa.

The Practising Physician in a Public Health Orthopædic Program.
Dr. B. F. Miller, Halifax.

Psychiatry

Post-traumatic Cerebral Syndromes.
Dr. J. C. Richardson, Toronto.

Modern Trends in Psychiatry.
Dr. Daniel Blain, Washington, D.C.

The Manner and Time for Psychiatric Referrals.
Dr. A. E. Moll, Montreal.

Personal Factors in Accidents.
Dr. G. E. Hobbs, London.

Radiology

Renal Tuberculosis.
Dr. H. B. Murphy, St. John's, Newfoundland.

Treatment of the Leukæmias.
Dr. Albert Jutras (Radiological Aspect) with the co-operation of Dr. Jean Pierre Jean, Montreal.
Dr. Arthur H. Squires, Toronto (Therapy).

Expanding Lesions of Bone.
Dr. J. W. McKay, Montreal.

Reticulum Cell Sarcoma of the Rib.
Dr. H. R. Corbett, Sydney.

Radiological Aspects of Duodenal Ulcer.
Dr. Richard Schatzki, Boston, Mass.

Surgery

Modern Methods in the Management of Prostatism.
Dr. Clarence L. Gosse, Halifax.

The Treatment of Acute Appendicitis.
Dr. G. M. Brownrigg, St. John's, Newfoundland.

Intra-thoracic Tumours.
Dr. R. C. Laird, Toronto.

Diverticulitis of the Sigmoid—Its Complications and Management.
Dr. P. H. T. Thorlakson, Winnipeg.

Thursday, June 22

ROUND TABLE CONFERENCES

9.00 - 10.30 a.m.

Medicine and Psychiatry

Psychosomatic Disorders of the Gastro-intestinal Tract.
Dr. Wendell Macleod, Winnipeg (Chairman); Dr. R. O. Jones, Halifax; Dr. Alan Walters, Toronto; Dr. R. K. Thomson, Edmonton; Dr. Robert M. MacDonald, Halifax; Dr. John Lovett Doust, New York.

Obstetrics, Gynæcology and Anæsthesia

The Relationship of Anæsthetics to Maternal and Fetal Mortality and Morbidity.
Dr. F. L. Johnson, Hamilton (Chairman); Dr. Kent Irwin, Charlottetown; Dr. Joseph Tanzman, Saint John; Dr. H. R. Griffith, Montreal; Dr. C. H. L. Baker, Halifax; Dr. L. E. Prowse, Charlottetown.

Otolaryngology

Local vs. General Anæsthesia.
Dr. R. H. Stoddard, Halifax (Chairman); Dr. H. W. Schwartz, Halifax; Dr. C. R. Stephen, Montreal; Dr. E. E. Scharfe, Montreal.
followed by two papers:

Secretory Otitis Media.
Dr. John R. Lindsay, Chicago.

Frontal Sinus Infection and Complications.
Dr. E. J. Washington, Winnipeg.

Pædiatrics

Pædiatric Surgical Conference at the Children's Hospital, Halifax.
Under the direction of Dr. J. W. Merritt and Staff of The Children's Hospital.

Surgery

Fractures of the Tibia and Fibula.
Dr. A. L. Murphy, Halifax (Chairman); Dr. Frank P. Patterson, Vancouver; Dr. L. H. McKim, Montreal; Dr. J. Harold Couch, Toronto.

GENERAL SESSION

Thursday, June 22

10.45 a.m.

Uterine Retroversion.
Dr. H. B. Atlee, Halifax.

Ménière's Syndrome: Diagnosis, Pathology and Treatment.
Dr. John R. Lindsay, Chicago.

The Changing Attitude to Drug Therapy.
Dr. D. Sclater Lewis, Montreal.

SECTIONAL MEETINGS

Thursday, June 22

2.15 p.m.

Industrial Medicine

What the General Practitioner and Industrial Physician Should Know about the Problems of Retirement.
Dr. R. B. Robson, Windsor, Ont.

Aviation Medicine.
Dr. H. E. Wilson, Ottawa.

Antihistamines in the Prevention and Treatment of the Common Cold in Industry.
Dr. D. C. Bews, Montreal.

Medicine

Acute Methyl Alcohol Poisoning.
Dr. D. J. Tonning, Halifax.

Hypertension—A Problem of Growing Importance.
Dr. J. A. Lewis, London.

The Early Diagnosis of Spinal Cord Lesion.
Dr. D. S. MacEachern, Montreal.

Public Health and Medical Care in Newfoundland.
Dr. Leonard Miller, St. John's.

Obstetrics and Gynæcology

The Diagnosis of Uterine Cancer.
Dr. Nelson Henderson, Toronto.

Clinical Research in Religious Orders on Carcinoma of the Cervix of the Uterus and Cancer of the Different Organs—General Considerations.
Dr. Fabian Gagnon, Quebec.

The Rôle of Obstetric Forceps in the Management of Dystocia.
Dr. John Mann, Toronto.

Surgery

Experiences with Lung Resection in Pulmonary Tuberculosis—A Review of Sixty Cases.
Dr. V. D. Schaffner, Dr. J. E. Hiltz, Dr. J. J. Quinlan, Nova Scotia Sanatorium, Kentville.

The Management of Gastric Hæmorrhage.
Dr. W. Keith Welsh, Toronto.

Recent Advances in the Treatment of Traumatic Shock.
Dr. D. L. C. Bingham, Kingston.

Commissurotomy in Mitral Stenosis.
Dr. Edouard D. Gagnon, Montreal.

Friday, June 23

ROUND TABLE CONFERENCES

9.00 - 10.30 a.m.

Medicine and Dermatology

Skin Lesions of Syphilis.
Dr. D. S. Mitchell, Montreal (Chairman); Dr. G. E. Craig, Montreal; Dr. J. C. McLean, Saint John; Dr. Dennis Howell, Halifax.

Medicine and Radiology

The Diagnosis and Treatment of Arthritis.
Dr. A. W. Bagnall, Vancouver (Chairman); Dr. Donald Graham, Toronto; Dr. H. P. Wright, Montreal; Dr. Henry Moyse, Summerside; Dr. Jean Bouchard, Montreal.

Obstetrics and Gynæcology

The Management of Difficult Labour.
Dr. George A. Simpson, Montreal (Chairman); Dr. F. D. Wanamaker, Saint John; Dr. D. L. Adamson, Hamilton; Dr. Brian Best, Winnipeg; Dr. W. R. Foote, Montreal.

Pædiatrics

The Problems of Adolescence.
Dr. G. B. Wiswell, Halifax (Chairman); Dr. H. B. Ross, Halifax; Dr. I. H. Erb, Toronto; Dr. John Ross, Toronto; Dr. Martin Hoffman, Montreal; Dr. R. O. Jones, Halifax; Dr. W. W. Barraclough, Toronto; Dr. C. J. W. Beckwith, Halifax.

Surgery

Biochemistry in Surgery.
Dr. P. H. T. Thorlakson, Winnipeg (Chairman); Dr. Angus McLachlin, London; Dr. Martin Hoffman, Montreal; Dr. Donald Webster, Montreal.

GENERAL SESSION

Friday, June 23

10.45 a.m.

The Management of Difficult Labour.
Dr. H. B. VanWyck, Toronto.

Carcinoma of the Lip and Tongue.
Dr. H. W. Wookey, Toronto.

The Place of Splanchnicectomy in the Treatment of Hypertension.
Dr. James A. Evans, Boston, Mass.

SECTIONAL MEETINGS

Friday, June 23

2.15 p.m.

Armed Forces

The Defence Medical and Dental Services Advisory Board.
Surgeon Captain A. McCallum, Ottawa.

The Results of Treatment of Penetrating Abdominal Wounds.
Dr. R. B. Eaton, Sackville, N.B.

The Functions of the Armed Forces Medical Services in Civil Defence.
Lieut.-Colonel J. McCannel, Ottawa.

Historical Medicine

The Surgery of Guy de Chauliac.
Dr. George H. Murphy, Halifax.

Lieut.-Colonel F. H. Mewburn.
Dr. Peter Campbell, Lethbridge.

The Halifax Bridewell.
Dr. H. L. Scammell, Halifax.

Medicine

The Sprue Syndrome.
Dr. Wendell Macleod, Winnipeg..

Choice of Patients for Sympathectomy in the Field of Peripheral Vascular Disease.
Dr. James A. Evans, Boston, Mass.

The Painful Back.
Dr. A. W. Bagnall, Vancouver.

Some Social and Economic Aspects of Drug Addiction.
Mr. K. C. Hossick, Ottawa.

Pædiatrics

Scurvy—Recent Experiences.
Dr. N. B. Coward, Halifax.

Poisonings in Infants and Children.
Dr. John Ross, Toronto.

Common Pitfalls in Pædiatric Diagnosis.
Dr. Stephen Weyman, Saint John.

Surgery

Surgical Treatment of Chronic Ulcerative Colitis.
Dr. Walter McKenzie, Edmonton.

Painful Feet.
Dr. Frank P. Patterson, Vancouver.

The Surgical Aspects of Gallbladder Disease.
Dr. George Skinner, Saint John.

ANNUAL MEETING
CANADIAN MEDICAL ASSOCIATION

By this time you will have decided to come to Halifax, in Nova Scotia, for the Annual Meeting. Afterwards you may spend a week or two roaming around. There are many things to see and do. In this regard Halifax itself is very satisfying. If you are interested in the history of Canada, political or military, this old city will richly repay you. It is a restful city, distinctly masculine, in contrast to so many cities which are feminine, but a nice, quiet sort of old chap who grows more friendly as you get to know him. His stock in trade is not all in his front window. You must dig a bit for it, and in this regard you will be willingly assisted by a well conducted Tourist Bureau.

Perhaps you will have had enough of the City during the meeting. There are guide posts in every direction to tell you where you may go and what you may see. There is very little to tell you much about the people you meet.

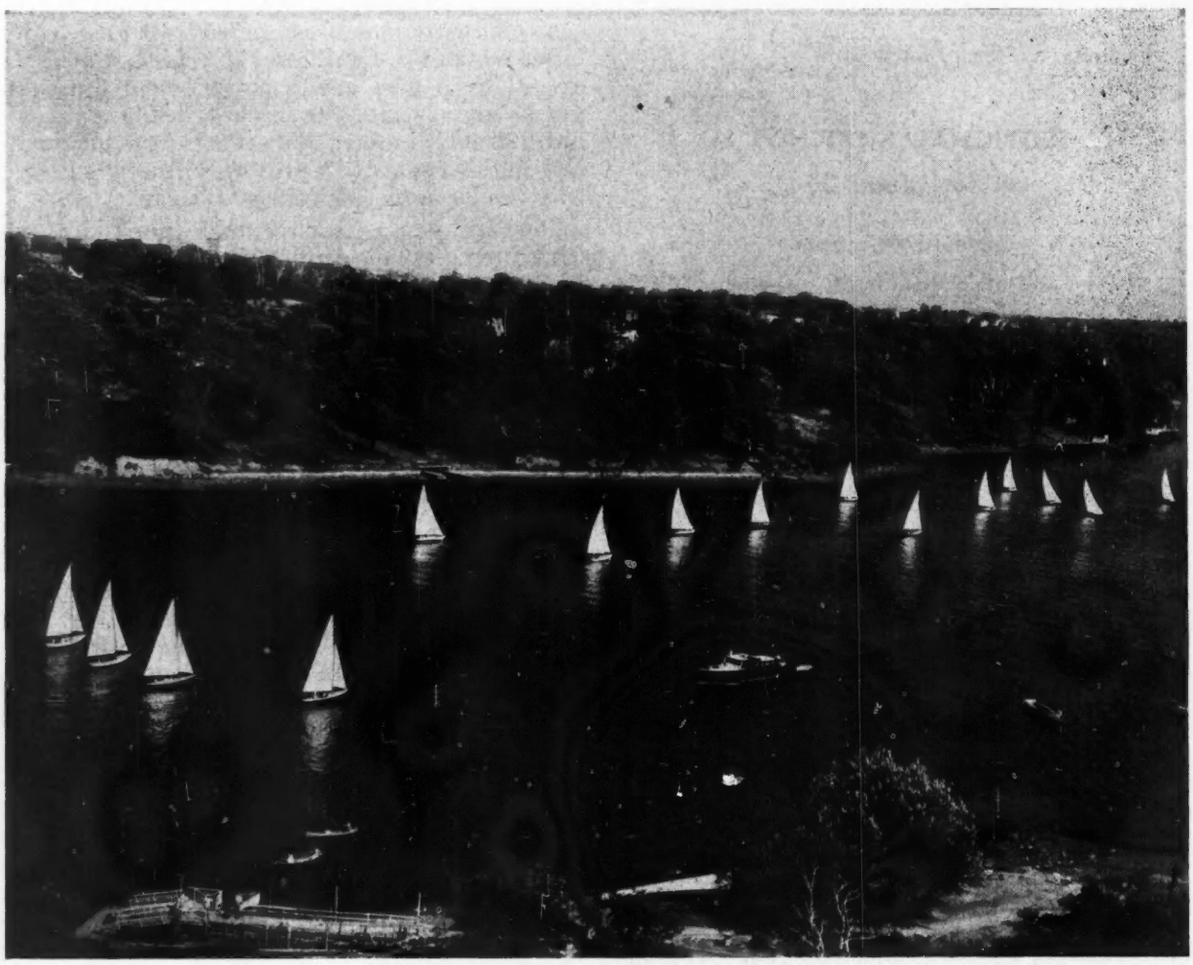
First of all, most of the people live but a short distance from the salt water. They know all about those "who go down to the sea in ships". Life and Death are very real to them. They will look you steadily in the eye, a bit astonished if you are in a hurry, but very anxious that you should be properly directed if you inquire your way. Their very reception is restful. Without uttering a sound they say, "Brother, take it easy. There is no hurry. The day is fine. The sun shines. Tomorrow it may rain. Let's talk awhile." Without realizing it you find that tension you have been aware of for months relaxing. All of a sudden you wonder if this is not the real philosophy of life. You watch these people work and again you wonder. It is deliberate, it is steady, and apparently effortless. Behind it you will find generations of persons who have done the same thing. It looks so easy, but try to row a boat like that old fisherman, not on a mill pond but on the seas in a stiff breeze. Watch those horny hands repair a net or weave the "head"

of a lobster trap. See him gaze at the sky, the water, the flight of the birds, and tell you of the weather tomorrow. Then you will feel a true sense of humility and a vague twinge of unrest about your sense of values. Whether you journey down the South Shore, the Eastern Shore, through the Annapolis Valley, the hills and dales of Pictou or Antigonish, or the lovely island of Cape Breton, you will be confronted by people who live very close to the real heart of things.

Did you ever see people—grown up people I mean—play? Well, get a friend, one of the native sons or daughters of Nova Scotia to take you to a real Highland Scottish gathering. The big affair at St. Ann's in Victoria County is fine, but it does not give you what you seek. At its best this is held in a big old farmhouse. The girls have just come home "from the States". The mats are rolled up, the furniture is pushed into another room. From some mysterious place comes a fiddle, perhaps two fiddles. Before you know it a square set is in progress. How they can dance! The music in their bones is drawn to their feet by the swift measure of the violins. They laugh from the sheer ecstasy of physical elation, and now and then some lad's pent up fervor bursts forth in one tremendous "Whee-ee-ee-ee!" Sometimes the ancient drink of Scotland plays a part in releasing inhibitions, but whether present or not you are conscious of one thing; that these folk are having a wonderful time. On and on they dance, never seeming to tire, until the first pink streaks of dawn tell them that work comes with the sun. If you can throw off that stiff office manner, offer your arm to some willing damsel and join in the fun: you will never forget it. For you will be back a thousand years when life was simple, close to reality, and there was no thought of the Iron Curtain or the Atom Bomb.

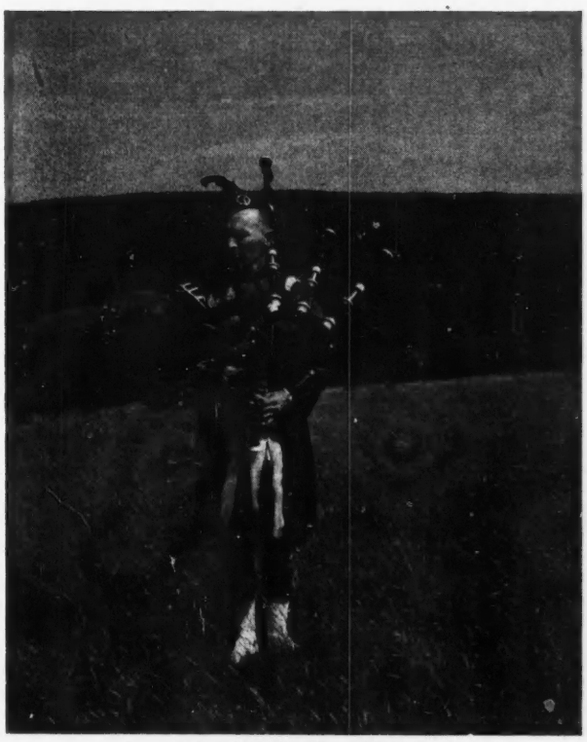
See that woman at Cheticamp work at her rug. She pushes the hook through the bottom catches the wool fed by her fingers below and brings it up neatly and evenly. You wonder at the deftness, but still more at the blending of the colours in that wonderful pattern. The colours of a thousand autumns are there translated into reality by a skill that is famous throughout this continent.

Stop to speak to this young man driving a road machine along a country by-road. His hair is red and he is plentifully adorned with



Yachting on the North West Arm, Halifax.

freckles. His eyes are blue and they give you the impression that his soul is revealed in them. You are amazed when he answers with a soft, distinctive accent, in flawless English. You learn that he is home from college for the summer and with the "spring work" on the farm over, he is earning something extra before the haying begins. He talks about himself shyly but will proudly tell how much he likes college, and what he hopes to do next year. Perhaps he can find a place in Nova Scotia, but if not he will go away, "to the States" or to "Upper Canada". There you see the tragedy of this little province. Like Old Scotland she has exported brains to her own loss and the gain of other lands. However, like



A piper in the glen.

Old Scotland today, the chances of remaining to enjoy a good life in the homeland are better than ever.

So on this note I would leave you. Come to the Annual Meeting to learn, to observe, to profit professionally. Come to Halifax and to Nova Scotia to regain your grip of that good spirit that keeps you close to the very soul of humanity.

H. L. SCAMMELL

The Canadian Society for the Study of Allergy

The Canadian Society for the Study of Allergy will hold its annual meeting, in association with the Canadian Medical Association meeting in Halifax, on Tuesday, June 20, 1950, in the auditorium of Victoria General Hospital.

An interesting program has been arranged, including the following papers: (1) Dermatological Allergy, Dr. K. A. Baird, West Saint John, N.B. (2) Dandelion as a Cause of Hay-fever, Dr. H. C. Jamieson, Edmonton, Alberta. (3) Antibody Studies in Hay-fever in Children, Dr. Sidney Pedvis and Dr. Harry Bacal, Montreal, P.Q. (4) Some Clinical Problems in Allergy, Dr. I. H. Erb, Toronto, Ont. (5) The Use of ACTH and Cortisone in Diseases of Hypersensitivity, Dr. Bram Rose, Montreal, P.Q. Guest Speaker: Dr. Kingsley Johnson, Cleveland Clinic, Department of Allergy, (subject to be chosen).

Allergy film to be shown: Allergy—Immunology, Diagnosis, Treatment, directed by Dr. Leo Criep, Associate Professor of Medicine, University of Pittsburg.

Canadian Neurological Society

The scientific sessions of the Second Annual Meeting of the Canadian Neurological Society will be held in the Clinic Room of the Royal Victoria Hospital, Halifax, on Sunday and Monday, June 18 and 19. All interested physicians and surgeons are invited to attend. The following program has been arranged:

Sunday, June 18.

9.00 a.m.—Registration.
Meeting of Council.

10.00 to 12.30, Morning Session.—Electroencephalographic Findings in Chronic Head Injuries, Errol B. Cahoon; Some features of Spinal Reflex Activity in Man, J. W. Magladery; Carotid-Cavernous Fistulæ, E. H. Botterell and J. W. Cluff; Subarachnoid Hæmorrhage, Intracerebral Hæmorrhage, and Intracranial Aneurysms, Anatol Dekeban and Donald McEachern; Postoperative Inflammatory Disease of Lumbar Discs—Problems of Diagnosis and Management, Frank Turnbull.

1.00 Lunch for Members.

2.00 to 5.00, Afternoon Session.—Case Presentations, W. D. Stevenson and Associates; Diet and Multiple Sclerosis, Roy L. Swank; Clinical Study of 77 Cases of Tumours Involving the Brain Stem, H. J. M. Barnett and H. H. Hyland; Anatomo-physiological Mechanisms in Epilepsy, Herbert Jasper; A method of Selection and Treatment of a Group of Patients Suffering from Atypical Facial and Head Pain, H. T. R. Mount.

7.30, Annual Dinner—Members and Guests.

Monday, June 19.

9.30 to 12.30, Morning Session.—Craniocerebral Topography, Wilder Penfield, Donald McRae and H. F. Steelman; Dermoid Cysts of the Lumbar Canal in Children, W. S. Keith; The Treatment of Tuberculous Meningitis with Streptomycin, Sir Hugh Cairns; A Survey of Cases of Disseminated Sclerosis in the Kingston Area, D. Naldrett White and Lorna Wheelan;

Highest Level Lesions, Wilder Penfield; Toxoplasmosis in Canada, F. L. McNaughton.

12.45, Lunch.

1.45 to 4.00, Afternoon Session, Symposium on Pain.—The Anatomy of Pain, Carlton G. Smith; Response in Patients with Intractable Pain Following Prefrontal Lobotomy, H. W. Elliott; Pain in Paraplegia, E. H. Botterell, J. C. Callaghan and A. T. Jousse; Tractotomy in the Brain Stem for Intractable Pain, C. G. Drake and K. G. McKenzie; Mental Pain, Aldwyn B. Stokes.

4.00 to 5.00, Business Meeting.

MEDICAL SOCIETIES

Winnipeg Medical Society

At a special meeting of the Winnipeg Medical Society on April 5 in conjunction with the University of Manitoba Refresher Course, Dr. A. W. Adson, Rochester, Minn., spoke on "Surgical Management of Arteriovenous Fistulæ and Cerebral Aneurysms" and Dr. Alton Goldbloom, Montreal, on "Chronic Metallic Poisoning in Children".

On April 28, Dr. A. A. Earn discussed "The Placental Circulation—An Investigation and Recent Views". Dr. T. L. Fisher, Ottawa, Secretary-Treasurer of the Canadian Medical Protective Association discussed medico-legal problems.

ROSS MITCHELL

Quebec Division of the C.M.A.

The annual meeting of the Quebec Division was held in Quebec City on May 5 and 6. The scientific meetings were held in the Pavillon Vachon which was very kindly loaned by Laval University, and proved to be an excellent meeting place. There was a full program of scientific papers, together with interesting material in the form of scientific exhibits. In addition, the commercial exhibits were numerous and well organized. The papers on the first morning dealt with Cancer of the Œsophagus, by Dr. H. Beaudet; Hypersplenism, by Dr. J. M. Delage; The Fundus in Hypertensive Disease, by Dr. Henri Pichette; Coronary Artery Disease, by Dr. Guy Drouin. The first afternoon was devoted to the subject of medical economics, at which Dr. J. Anderson, President of the C.M.A., spoke, together with Drs. A. Kelly and C. A. Gauthier. The dinner in the evening was shared in by the medical students of Laval University, whose very active president, Monsieur R. Roberge was co-chairman with Dr. A. C. Hill, president of the Division.

On Saturday morning papers were presented as follows: Dr. G. H. Larue and Prof. Guy Nadeau on Metabolic Variations in Schizophrenia; Dr. A. Martel on ACTH and Cortisone; Dr. Jean Sirois on Lobotomy; Dr. Sylvio Leblond on Antihistaminics; and Dr. R. Lessard on Antibiotics. After lunch, at which the Hon. Antoine Rivard gave an interesting address on Aspects of Medico-Legal Medicine, the case report discussion was held. This has become a regular feature of the meeting, and evoked great interest. Prizes for the correct solution of the report were awarded by the commercial exhibitors.

The weather was kind and the meeting was extremely successful. The Quebec Division make most excellent hosts.

Regina and District Medical Society

The regular monthly meeting of the Regina and District Medical Society was held in the Hotel Saskatchewan on Tuesday, April 18. There was an excellent attendance. The meeting took the form of a dinner, followed by an address. Dr. J. D. Leishman, Chairman of the Group Health Services presented a plan for prepaid medical care of the catastrophe type, that is, medical care in all aspects except office and house calls. This was approved and the organization given permission to carry on. Dr. D. E. Rodger presented a report on the activities of the Canadian Arthritis and Rheumatism Society for the information of the members. This was presented at this time since the month of May is being taken up with a refresher course under the combined auspices of the District Medical Society and the Department of Veterans' Affairs. The Refresher Course is to last three days and no regular meeting will be held separetely for that month.

The main speaker of the evening was Dean S. Basterfield, who has retired from the Deanship of Regina College. Dr. Basterfield gave an excellent address on the history of medical science and the steps leading to the present close integration of all the basic sciences involved in the practice of medicine.

Saskatchewan Surgical Society

The Saskatchewan Surgical Society held their second annual meeting in Saskatoon on April 22 and 23, 1950. Meetings were held in the Lecture Theatre in the College Building and were open to all interested members of the profession. Besides having papers presented by the members and discussion on case reports, the Society had invited Dr. L. B. Jaques to present a paper on "Recent Studies in Anti-coagulants" and Dr. D. F. Moore who presented a paper on "Portal Obstruction". The meeting was well attended. The papers presented covered a wide section of surgical practice and stimulated considerable discussion.

CANADIAN ARMED FORCES

News of the Medical Services

Major-General Frank Kingsley Norris, C.B.E., D.S.O., E.D., Director General of Medical Services of the Australian Army, visited Canadian Army medical installations and Army Headquarters, Ottawa, during the period April 5 to 22, his itinerary including units at Vancouver, Winnipeg, Fort Churchill, Ottawa, Kingston, Toronto and Montreal. Major-General Norris has served in the Australian Army Medical Corps since 1916. Commencing the late war as Commander of No. 2/1 Australian C.C.S., he served as A.D.M.S., of the 7th Australian Division from April, 1940 to May, 1943, and thereafter as D.D.M.S. 2nd Australian Corps in the rank of Brigadier until April, 1944. Following his Canadian visit, Major-General Norris proceeded to the United Kingdom for a tour of British Medical units.

Lieut.-Col. G. L. Morgan Smith, O.B.E., R.C.A.M.C., of Winnipeg, Manitoba, Command Medical Officer of Prairie Command, obtained the second highest standing among all candidates passing the recent Canadian Army Staff college examinations. Captain R. A. Barrington, R.C.A.M.C., of Army Headquarters, was also successful in passing the examinations.

Major D. F. Ballantyne, R.R.C., R.C.A.M.C., Matron-in-Chief of the Army Medical Services has been placed on the retired list because of ill health. She is succeeded by Major E. E. Andrews, A.R.R.C., R.C.A.M.C., formerly Matron of Toronto Military Hospital.

The intake of C.O.T.C. cadets for summer training at the R.C.A.M.C. School at Camp Borden this year includes as before students from all the Canadian medical schools. The enrolment includes 63 third year, 74 second year, and 71 first year candidates.

The third school of aviation medicine for Department of Transport medical examiners was recently held at the R.C.A.F. Institute of Aviation Medicine, Toronto, Ont. Thirty civilian medical men participated in this course, the third of a series put on jointly by the R.C.A.F. and Department of Transport.

A portable miniature x-ray unit of the latest design has been procured by the R.C.A.F. and will be based at R.C.A.F. Station, Rockcliffe, Ontario, together with a 300 M.A. diagnostic unit of the latest design. The portable unit will be utilized for annual chest surveys of personnel of the three services in the Ottawa area, and will be available for transport to other units for similar surveys.

Three airmen of the R.C.A.F. medical branch are at present attending a course in radiography at the Ottawa Civic Hospital. This is in accordance with the R.C.A.F. policy of providing specialist technician training to airmen personnel.

Squadron Leader Francis M. Oakes, A.R.R.C., Principal Matron, R.C.A.F., attended the annual meeting of the Registered Nurses Association of Ontario, held in Toronto, April 27 to 29, 1950.

CORRESPONDENCE

Children's Health Centres

To the Editor:

I was very much struck by Dr. Donald Paterson's paper appearing in the January issue of the *Canadian Medical Association Journal*, entitled "Children's Health Centres and Their Uses". It seems to me that this is a great step forward in an endeavour to correlate the services for children in the City of Vancouver.

The arrangements and suggestions in Dr. Donald Paterson's medical health centre point the way to the establishment of children's clinics in central points in different areas in this country. They form an excellent opportunity not only for a service to the public, but for the benefit of the practising physicians in that area where specialized services can be obtained upon referral of patients. Various social agencies responsible for care of children also find this of great benefit. A child health centre of this type does not in any way take over the duties of the Out-Patient Department of a hospital, but is rather a supplement to such a service.

The steady increase in the monthly attendance at this clinic illustrates the fact that the physicians and the public recognize its value and are taking advantage of its services.

The importance of such a centre in the teaching and training of physicians in this branch of Medicine is obvious.

ALAN BROWN,
Physician-in-Chief,
The Hospital for Sick Children Professor of Pædiatrics
Toronto.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

P.R.C.P.

With the increasing integration of Medicine and State, the Presidency of the Royal College of Physicians of London has become a position of national, and not only medical, importance. The change was initiated and developed rapidly during Lord Dawson of Penn's long and honourable tenure of office. The advent of the National Health Service made it abundantly clear that the College, like its two sister colleges, was destined to play a vital rôle in the medical organization of the country. No-one appreciated this better than Lord Moran, whose nine-years' period as President has now come to a close. It is well over a century since this long tenure of office has been emulated, and it is a term of office which will long remain memorable in the annals of the College. His successor is Dr. Russell Brain, well known as a neurologist and as an authority on the medical history of Dr. Samuel Johnson. He assumes office at a critical period in the history of his College and of the profession, and it is a high compliment to him that Fellows of the College should have decided that of their number he is the one most suited and able to carry out the increasingly onerous duties attached to his new office. His election, incidentally, means that of the last four Presidents of the College, three have been members of the staff of the London Hospital: Lord Dawson of Penn, Sir Robert Hutchison, and Dr. Russell Brain.

THE HEALTH OF THE NATION

The recently published report of the Ministry of Health for 1948 indicates that the general trend of the national health is satisfactory, with record low figures for the general death rate (10.8 per 1,000), the infant mortality rate (33.9 per live births) and the maternal mortality rate (1.02 per 1,000 live births). On the other hand, certain disturbing developments are evident. One of these has been given unpleasant prominence by the smallpox outbreak in Glasgow. During the second half of 1948 it is estimated that less than 20% of infants were primarily vaccinated, compared with 41.6% in 1946 and an average of 36.8% for the ten-year period 1937-46. The other disturbing feature is the position of tuberculosis. Although the over-all mortality from all forms of tuberculosis reached a new low record in 505 per million living, the proportion of deaths from tuberculosis of patients not notified before death rose from 1 in 8 of the deaths before the 1939-45 war to 1 in 6. Of more significance is the fact that there is an increase of 7% in the number of patients on the waiting list for institutional treatment. The same unfortunate trend is evident in the report of the Department of Health for Scotland for 1949. The number of new cases of respiratory tuberculosis notified in 1949 was 8,427, compared with 8,204 in 1948 and 7,984 in 1947, whilst the number of patients with respiratory tuberculosis awaiting admission to hospital at the end of 1949 was 2,877, compared with 2,572 at the end of 1948.

INOCULATIONS AND POLIOMYELITIS

Much interest has been aroused by the reports in the English medical press of an apparent correlation between prophylactic inoculations, particularly against whooping cough, and the incidence of poliomyelitis in young children. The original report came from Australia, but similar findings have been reported from this country. The whole problem was fully discussed at a crowded meeting of the epidemiology and state medicine section of the Royal Society of Medicine at the end of April. One of the points brought out in this discussion was that no such apparent correlation has been reported from the United States of America where the incidence of poliomyelitis and the use of prophylactic inoculations for whooping cough are much greater than over here. The general consensus was that the association was by no means proved, but that the evidence was important enough to justify a full and searching investigation of the whole problem, especially as there was already evidence of the published reports influencing unfavourably the immunization against diphtheria.

CIVIL SERVICE DOCTORS

The curious proclivity of the present Government for applying their methods of bulk buying to their dealings with professional men is nowhere better ex-

emplified than in what can only be described as the dictatorial way in which the Chancellor of the Exchequer has dealt with the claims of the senior grades of the Civil Service for increases in salary. The Civil Service medical officers have refused to lie down under this Crippsian steam-roller, and since last August negotiations have been under way in an attempt to bring the salaries of Civil Service doctors into line with those recommended in the Spens Committee report. So far these negotiations have achieved nothing. The latest step is that, at the request of the Civil Service Medical Officers' Joint Committee, and in accordance with the decision of the Council of the British Medical Association, the *British Medical Journal* has announced that it will cease to publish advertisements for vacancies in the medical Civil Service until the present deadlock is broken. It is to be hoped that this drastic step will bring matters to a head. Certainly things cannot be allowed to drift much longer, if anything like efficiency is to be maintained in the various Government departments concerned. For instance, since 1947 20 medical officers have left the Ministry of Health, whilst the Department of Health for Scotland is four short of its full complement of 27, and it is reported that 15 out of the 24 are seeking other posts.

WILLIAM A. R. THOMSON

London, May, 1950.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Acute Herpetic Gingivo-Stomatitis in the Adult. Rogers, A. M., Corriel, L. L., Blane, H. and Scott, T. F. McN.: *New England J. Med.*, **241**: 330, 1949.

Infection with the virus of herpes simplex occurs in about 70% of cases in infancy or early childhood. Clinical manifestations, usually the outbreak of recurrent herpes labialis or "fever blisters" may occur in childhood or adult life. Except for these, in most cases the infection is unproductive of symptoms, the only indication of its presence being circulating antibodies. The recurrent attacks of herpes are generally accepted as a reactivation by specific stimuli. In about 1% of all infections, the first attack of the virus can give rise to serious or fatal disease. Of the primary infections the commonest is the clinical entity, acute herpetic gingivo-stomatitis. This rarely occurs in adult life, and when it does the true nature of its etiology may not be recognized.

The authors describe the occurrence of such disease in 3 adults. In all cases the clinical impression of herpes virus etiology was corroborated by laboratory findings. Detailed description of the clinical picture presented, together with microphotograph of a biopsy section and photograph of the lips and gums are given in two cases. No patient had previously had herpetic lesions or apthous ulcers and in two there was a record of recent contact with a person with a "cold sore". The chief complaint was sore throat, fever (100 to 103°) and malaise. The commonest appearance was of minute shallow discrete ulcers on the mucous membranes, in some cases vesicular lesions were seen, and there was regional lymphadenopathy. Healing occurred without scarring. There was no significant change in the leucocyte count. The differential diagnosis includes Vincent's infection, erythema multiforme, infectious mononucleosis, syphilis, agranulocytosis, leukæmia, pemphigus and diphtheria. The treatment is symptomatic with control of secondary infection by fusospirochætal organisms, or pyogenic cocci, with penicillin.

D. E. H. CLEVELAND

The Problem of Bronchiectasis. McGovern, B. F.: *Dis. Chest*, **15**: 208, 1949.

Unlike tuberculosis, the tendency of many forms of bronchiectasis is to progress and to terminate by death in the third decade. Any condition which causes bronchial stenosis predisposes to bronchiectasis. The sequence of essential etiology and pathogenesis is as follows: bronchial stenosis with retained infective secretions permit infection of the bronchial walls and weakening of the elastic supporting tissue; this allows the rhythmical inspiratory pull, augmented possibly by the weight of the pooled secretions, by atelectasis and by a check-valve mechanism, gradually to dilate the walls of the bronchi and lung units into permanent or potential cavities. Repeated respiratory infections result in further destruction of the bronchial walls and lung parenchyma and gradual replacement by inelastic scar tissue. The loss of functional units in the lung and the mechanical obstruction to blood flow leads to right ventricular and eventually congestive heart failure. Blocked infected secretions may produce lung abscess. Other serious complications are recurrent pneumonitis or pneumonia, metastatic abscesses, amyloid disease, nephritis or massive hæmorrhage.

Bronchiectasis can develop at any age but the great majority of cases develop during the first ten years of life. The left lobe is most frequently involved (35%) and with it, the lingual segment; the right lobe and both lower lobes are involved in 19% of cases and the right middle lobe is seldom involved. The diagnosis of advanced bronchiectasis is usually easy but to diagnose the prebronchiectatic state requires constant diagnostic suspicion and readiness to act. An unresolved pneumonia; a subacute sinusitis or bronchitis; and a low grade temperature, weight loss, listlessness, with or without cough, that persists after an acute respiratory infection, may be the first vague hint of developing bronchiectasis. In any suspected case, bronchography should be done and if indicated, bronchoscopy.

The treatment of advanced bronchiectasis is surgical removal of the affected area if this can still be done. The mortality rate is now less than 2%. Palliative treatment includes drainage, antibiotics, general hygienic measures, treatment of complications and residence in a dry warm climate. The correct use of vaccines in children and vasoconstrictors in sinusitis often produces surprisingly good results. Pneumoperitoneum is probably the best of minor collapse procedures in the emergency treatment of massive pulmonary hæmorrhage.

J. F. SIMPSON

Right- or Left-Handedness. Eustis, R. S.: *New England J. Med.*, **240**: 249, 1949.

The problem of right- or left-handedness is considered in detail and the many controversial points relating to development and effect are discussed. The author concludes that many apparently left-handed primary grade children can be successfully taught to write with the right hand. Such teaching should always be attempted since it conforms to the customs of the majority. If the child objects strenuously, or develops signs of nervous strain, of which stuttering may be one, he should be allowed to use his left hand without criticism. If left-handed writing is allowed the proper position of the paper is important and it should be placed with the top border to the right. There is a strong tendency for these children to imitate the paper-position used by their right-handed neighbours. Left-handed children should be allowed to write with a slight backhand slant, if they so prefer.

NORMAN S. SKINNER

The Diagnostic Problem of Primary Pleural Effusions. Kraft, J. R.: *Am. Rev. Tuberc.*, **59**: 259, 1949.

The accepted practice at present is to consider all primary pleural effusions as tuberculous or "probably tuberculous" until proved otherwise. The differences in the prognosis and treatment between tuberculous

and benign pleural effusions are substantial, but unfortunately, there are no diagnostic methods available for the ready identification of the various forms of primary pleurisy. The present report is a review of 100 cases of primary pleural effusion with particular attention to the diagnostic problems involved. The series consisted of male service personnel, 90% of whom where in the 18 to 30 year old group. All cases were followed for a minimum of six months.

77% of the patients had symptoms for seven or more days prior to seeking medical aid. The subjective symptoms were chest pain (94%), malaise and fever (88%), weight loss (82%), cough and sputum (25%) and dyspnœa (12%); 35% of the effusions tested by guinea pig inoculation were positive for tubercle bacilli. The erythrocyte sedimentation rate was markedly elevated at the onset of the effusion and was directly related to the regression of the pleural fluid. The white blood cell count was not significantly abnormal. Twenty-one patients developed pulmonary tuberculosis within an average of 6.2 months of the onset of the effusion. All of the lesions, except two, were minimal in extent, and were initially noted upon the same side as the effusion. The apical lesions were typical of reinfection pulmonary tuberculosis and in ten patients the lesion was suggestive of a primary focus.

The insidious onset of pleural effusion and the lack of definite laboratory data emphasize that the diagnosis for the most part depends upon careful differential diagnosis and clinical experience. It is apparently impossible to predict from the findings during the stage of the effusion whether pulmonary or other lesions will subsequently occur. In the absence of satisfactory diagnostic tests, certain cases of pleural effusion must be classified as "probably tuberculous", although they may represent instances of primary atypical pneumonia. These cases should be treated in the same way as those in which the tuberculous etiology is established. The treatment recommended for primary pleural effusions consists of sanatorium care (usually one year) followed by clinical, bacteriological and roentgenographic examinations.

J. F. SIMPSON

Rubella (German Measles) and Congenital Deformities. Wesselhoeft, C.: *New England J. Med.*, **250:** 258, 1949.

German measles occurring during pregnancy has been blamed as a cause of abortion, still-birth and congenital anomalies. The literature records 656 cases of severe congenital deformities in children born to mothers who had been affected by rubella during pregnancy. Only 124 normal infants are on record following pregnancies complicated by this infection. While rubella is considered to be a potent cause of congenital defects its true importance is impossible to estimate. This is an important problem and should be accurately assessed by means of compulsory, nation-wide reporting of the disease, with special note of its relation to pregnancy and an accurate follow-up to determine the incidence of congenital anomalies among the offspring.

NORMAN S. SKINNER

A Comparison of Pteroylglutamic Acid and Liver Extract Maintenance Therapy in Sprue. Fox, H. J.: *New England J. Med.*, **240:** 801, 1949.

Synthetic folic acid was employed in the treatment of seven cases of sprue for a period of over a year. While it proved to be more effective than massive doses of purified liver extract previously used in the same patients, and caused uniform improvement in all but one case, it was not as effective in controlling the anæmia. The necessary daily dose of folic acid varied from 15 to 30 mgm. One case failed to respond to either purified liver extract or to folic acid and required massive intravenous amounts of crude liver extract. All patients were maintained on a low fat diet. Additional vitamin therapy was discarded as the experience of the author led him to the conclusion that it was without value in the therapy of sprue.

NORMAN S. SKINNER

Diagnosis of Early Carcinoma of the Cervix by Sponge Biopsy. Gladstone, S. A.: *New England J. Med.*, **241:** 48, 1949.

If the treatment of cancer is to be successful diagnosis must generally be made before symptoms develop. The cervix uteri is an ideal site for such early diagnosis because of its ready accessibility and it is possible to detect the presence of malignant disease in this situation prior to the onset of signs, symptoms or anatomic changes visible on clinical inspection. Sponge biopsy is a valuable means of proving the presence of early carcinomatous change. It consists essentially of the rubbing of a portion of sponge over the site to be examined, the sponge subsequently being suitably prepared for microscopic examination by methods similar to those employed for ordinary tissue sections. Cancer cells can then be demonstrated in the interstices of the sponge material. Gelfoam was employed by the author because it would withstand the solvents employed in the preparation for microscopic examination. Two cases of cervical cancer, both asymptomatic and free of any clinical sign of malignancy, were diagnosed by sponge biopsy and confirmed following operation. This method of diagnosis is recommended as a valuable means of detecting early carcinoma.

NORMAN S. SKINNER

Cardiac Disease in Pregnancy. Vander Veer, J. B. and Kuo, P. T.: *Am. Heart J.*, **39:** 2, 1950.

A statistical study is presented of 409 cases of heart disease in a group of 26,628 pregnant women delivered at the Pennsylvania Hospital in Philadelphia. This incidence (1.5%) corresponds well with the incidence in other series. The majority (324 cases) had rheumatic heart disease. There were 51 cases of hypertensive heart disease and 18 with congenital lesions. In the whole series there were 46 maternal deaths, and of this number, 14 were attributed to cardiac causes, 10 of the 14 dying in congestive failure. The benefits derived from digitalization at the earliest sign of failure underline the importance of frequent examination. Acute infections of the respiratory tract may be associated with heart failure and must be treated with care. Patients in Class 1 and 2 (New York Heart Association criteria) may undertake pregnancy, but those in Class 3 and 4, if not past the fourth month, should be advised to have a therapeutic abortion. It is the opinion of the authors that pregnancy is not harmful in hypertensive women if toxæmia of pregnancy does not occur. The non-surgical management of the cardiac cases is advocated. Failure occurred in the seventh and eighth month in 7 of the 10 cases. 3 cases developed acute pulmonary œdema in the first two days of the puerperium, the mechanism of this event being unexplained.

ARNOLD L. JOHNSON

Surgery

Obstruction of the Inferior Vena Cava Above the Renal Veins. Ripstein, Chas. B. and Miller, E. G.: *Ann. Surg.*, **130:** 958, 1949.

A case is reported in which a large benign retroperitoneal tumour was removed. The excision of the fibromyoma which stretched and occluded the vena cava above the renal veins necessitated removal of the right kidney and suture of the vena cava. Anuria and urœmia were treated by the use of the artificial kidney for six hours a week postoperatively. Following this renal function was regained, the artificial kidney being of value in the period of waiting for collateral circulation to develop.

BURNS PLEWES

Postoperative Nitrogen Loss. Werner, S. C., Habif, D. V., Randall, H. T. and Lockwood, J. S.: *Ann. Surg.*, **130:** 688, 1949.

Studies of the nitrogen balance in 26 patients who had interval cholecystectomy or herniorrhaphy, but were otherwise healthy, were made in the Surgical Metabolism Unit of the Presbyterian Hospital. The effect of the trauma of operation was differentiated from the effect of the usual changes in dietary intake. When the lower caloric intake usually given after operation was started preoperatively and continued unchanged through the day of operation and beyond, no significant change in nitrogen output resulted from the operative procedure. Under such conditions the so-called alarm-reaction of endocrine origin was not demonstrated. BURNS PLEWES

The Efficacy and the Safety of the Intramuscular Administration of Bacitracin in Various Types of Surgical and Certain Medical Infections. Meleney, F. L., *et al.*: *Surg., Gynec. & Obst.*, **89:** 657, 1949.

Difficulties in manufacturing a non-toxic preparation of bacitracin and studies of the frequent but temporary albuminuria that accompanied its administration are described. Two hundred and seventy cases were treated in six different centres in the United States. Three-fifths of these had infections which had failed to respond to other antibacterial agents, and 55% responded favourably to bacitracin. In all 78% responded favourably to this drug. The majority of cases had infection due to a mixture of organisms. A majority of patients had built up a resistance to penicillin. The surface growth method of preparation of bacitracin resulted in a drug that gave evidence of minimal nephrotoxicity as compared to the early deep-tank preparation, but the later preparations meeting the toxicity tests of the Food and Drug Administration gave good results. Many case histories are given to illustrate the findings in this study. BURNS PLEWES

An Evaluation of Oxygen Therapy. Price, P. B., Richards, R. C. and Hamond, J. B.: *Ann. Surg.*, **130:** 747, 1949.

Though it seems common belief and is stated in textbooks that oxygen is beneficial in shock, doubt is expressed that the administration of oxygen increases the patient's oxygen consumption. Dogs were anæsthetized and subjected to shock from crushing injuries, burns, peritonitis, obstruction and histamine. The administration of 100% oxygen did not result in clinical improvement or increased oxygen consumption. If respiration was embarrassed by any means, oxygen therapy caused clinical improvement and total oxygen uptake was increased. The relief of dyspnœa was associated with a fall in blood pressure in these dogs who were in respiratory difficulty and in some cases the increased hypotension was dangerous.

When circulatory failure and respiratory difficulty or disease coexist, oxygen may tide the patient over a brief critical period. Anoxia is difficult to assess but usually cyanosis is a sign of severe oxygen deficiency. Lesser but dangerous degrees of anoxia may exist without other manifestation than the progressive deterioration of the patient's condition. Anoxæmia is not a true measure of anoxia. Oxygen lack due to circulatory failure is not relieved by oxygen therapy, but if due to respiratory dysfunction oxygen should be administered. It is more important to relieve the embarrassed respiration and failing circulation. Oxygen therapy should be used less frequently than it is at present in many centres. BURNS PLEWES

Transmetatarsal Amputation for Infection or Gangrene in Patients with Diabetes Mellitus. McKittrick, L. S., McKittrick, J. B. and Risley, R. S.: *Ann Surg.*, **130:** 826, 1949.

Of a total of 215 diabetic patients upon whom a transmetatarsal amputation was done, there were two hospital deaths, 155 healed completely by the time of discharge, 60 failed to heal, 27 had a higher reamputation, 33 left hospital incompletely healed, 7 remained healed for a minimum of a year, and then had higher reamputation. The preoperative and postoperative care of these patients is important. Most were in hospital for 3 weeks and the diabetes was well controlled at the time of operation. Posture in bed and Buerger's exercises were emphasized, as is the very careful technique of operation. In the discussion of this presentation to the American Surgical Association, the use of skin grafts to cover the granulating stump, the value of sympathectomy, the evaluation of collateral circulation before operation were brought out by several authorities on peripheral vascular disease. It was agreed that with antibiotics and great care more conservative amputations could be done in even the aged diabetic. BURNS PLEWES

Minimum Postoperative Maintenance Requirements for Parenteral Water, Sodium, Potassium, Chloride and Glucose. Elman, R., Lemmer, R. A., Weichselbaum, T. E., Owen, J. G. and Yore, R. W.: *Ann. Surg.*, **130:** 703, 1949.

The amounts of intravenous fluids and electrolytes necessary to maintain balance in the first 96 hours after cholecystectomy were studied in forty patients. Adequate urinary output was maintained by an intake of 2 litres, except during the first 24 hours. When no electrolytes are given the body conserves sodium and chloride but not potassium and phosphate. No changes in blood levels were observed on an intake of 4 gm. sodium (chloride) and 6 gm. potassium (chloride). If 9 gm. of sodium chloride per day are given there is a lag in excretion so that about 14 gm. are retained in 4 days. It is estimated that an intake of 2 litres of water plus 2 to 4 gm. of a mixture of sodium and potassium chloride (or gluconate) would meet minimal requirements per 24 hours; 100 gm. of glucose per day spares as much nitrogen as 200 gm. though acetonuria is more frequent. But glycosuria was more frequent with 200 gm. per day. BURNS PLEWES

Maladie du sphincter d'Oddi. Analyse de 70 observations nouvelles recueillies du 12-7-45 au 7-5-49. (Disease of Oddi's sphincter; 70 new cases observed during the 4 last years.) Mallet-Guy, P., Feroldi, J. et Micek, F.: *Lyon Chirurgical*, **45:** 33, 1950.

Par l'analyse de ces 70 observations nouvelles, les A. recherchent "dans quelle mesure et sur quels points particuliers pourraient être modifiées ou complétées les conclusions déjà apportées par deux d'entre eux dans un précédent travail". Les A. ayant distrait de la présente étude deux observations mentionnant une lithiase de la voie principale ont maintenant une pratique de la maladie du sphincter d'Oddi qui porte sur 104 observations, dont 47 au cours de la lithiase et 57 en dehors d'elle. Chaque fois, en cours d'opération, la vérification du diagnostic a été faite, grâce au contrôle manométrique et radiographique extemporané. Cette étude analytique envisage d'une part l'angle physio-pathologique, d'autre part les facteurs étiologiques, et finalement les constatations anatomo-pathologiques.

1. *Physio-pathologie.*—L'hypertonie du sphincter d'Oddi dans le cadre des hypertonies des voies biliaires; le degré maximum est représenté par un spasme de la totalité de l'hépato-cholédoque; plus fréquemment se trouve réalisée l'hypertonie conjuguée des zones sphinctériennes de Lutkens et d'Oddi; ces deux spasmes sphinctériens peuvent d'ailleurs s'échelonner dans le temps. "L'enchainement des faits peut être le suivant: à l'origine hypertonie diffuse des voies biliaires, qui peu à peu s'estompe et dont la localisation oddienne persistera à titre de séquelle" se compliquant ultérieurement de sclérose musculaire.

2. *Facteurs étiologiques.*—Parmi ces facteurs, les A. relèvent 2 fois la tuberculose pulmonaire, 1 fois le diverticule re la région vatérienne du duodénum, 7 fois la coexistence d'un ulcère duodénal, un cas de pancréas

aberrant, la lithiase banale de vésicule dans 22 cas, et le syndrome récidivant après cholécystectomie dans 10 cas.

3. *Documents anatomo-pathologiques.*—26 biopsies sphinctériennes apportent les précisions nouvelles suivantes: "possibilité de lésions inflammatoires de la seule muqueuse vatérienne, éventuelle association de sclérose sphinctérienne et d'adenomatose microkystique, lésions des cellules nerveuses sympathiques, stades évolutifs successifs de la maladie, lésions d'amont pouvant s'observer sur la voie principale, la vésicule, le parenchyme hépatique ou le pancréas".

Cet article mérite lecture et étude attentive. Avec les travaux précédents sur la maladie du sphincter d'Oddi, et l'étude clinique et thérapeutique qui sera publiée ultérieurement, il formera en quelque sorte un corps de doctrine dont il faudra tenir compte et dont le grand mérite reviendra, certes, à l'Ecole de Lyon.

PIERRE SMITH

Obstetrics and Gynæcology

Torsion of Normal Fallopian Tube. Soldenhoff, R. de: *Brit. M. J.*, 263, 1949.

A case is described of torsion of a Fallopian tube with three clockwise twists removed by operation. There was no evidence of pregnancy, or of ovarian cysts. The theories of causation are discussed. ROSS MITCHELL

Growth of the Fetal Biparietal Diameter During the Last Four Weeks of Pregnancy. Josephs, S.: *Brit. M. J.*, **2:** 1442, 1949.

Two hundred and twenty-three estimations of intrauterine fetal biparietal diameters, performed on 189 patients, are compared with calliper measurements obtained on the third day after birth. Eighty-four cases were estimated radiologically within seven days of delivery.

In 34 cases radiological cephalometry was performed twice, with a minimum of 21 days between the examinations. For individual cases the predicted measurement will be within 0.1 in. of the calliper measurement in 75% of cases, and within 0.15 in. in 95% of cases.

For groups of over 16 cases, accuracy of 0.02 in. may be claimed for the mean reading. Radiological cephalometry over-estimates the biparietal diameters by approximately 0.02 in. There is no sign of a growth curve between the 36th and 40th weeks of pregnancy.

ROSS MITCHELL

Recent Trends in Cæsarean Section. Douglas, R. G. and Landesman, R.: *Am. J. Obst. & Gynec.*, **59:** 96, 1950.

At the Woman's Clinic, New York Hospital, the incidence of Cæsarean section has increased from 2 to 4% during the years from 1933 to 1947. The low flap transperitoneal section has gradually replaced the classical and extraperitoneal techniques. A review of maternal mortality at this clinic indicates an absence of deaths from infection during the past eight years. Seventy Cæsarean sections preceded by over 24 hours of labour are reported in a series of 419 consecutive sections since the use of prophylactic combined chemotherapy from January, 1946 to July, 1948: 61 were performed by the low flap route and 9 by the extraperitoneal route. No serious infections were encountered. With the prophylactic use of modern surgical supportive therapy, including chemotherapy, electrolyte and fluid balance, adequate nutrition, and intestinal intubation, the extraperitoneal or radical Cæsarean sections have not been indicated. The low flap section is simpler to perform, is without adjacent structure injury and is without protracted wound drainage. Peritoneal surfaces may adequately care for large amounts of bacterial contamination if the source of such infection is limited and chemotherapy is instituted early. When gross negligence results in intrapartum infection which cannot be controlled, extraperitoneal section or Cæsarean hysterectomy may be indicated. ROSS MITCHELL

The Influence of Diethylstilbœstrol on the Progress and Outcome of Pregnancy as Based on a Comparison of Treated with Untreated Primigravidas. Smith, O. W. and Smith, G. V. S.: *Am. J. Obst. & Gynec.*, **58:** 994, 1949.

In a clinical experiment aimed at determining the value of diethystilbœstrol in the prevention of complications of late pregnancy, 387 primigravidous women in the prenatal clinic at the Boston Lying-in Hospital were given the drug in gradually increasing doses from the early part of pregnancy (weeks 12 to 20) to the thirty-sixth week. Alternate primigravidas were treated 555 synchronous untreated patients serving as controls. Except for stilbœstrol administration the obstetrical care of the two groups was identical.

The incidence of late pregnancy toxæmia was very low (2.3%) in the stilbœstrol-treated patients. The difference between this figure and the 6.8% incidence in the control group could not have occurred by chance. In the few cases that developed despite stilbœstrol, the disease was later in onset and less severe than in the control group. Analysis of the data on spontaneous premature delivery revealed that the premature infants of stilbœstrol-treated mothers were unusually large and mature for their gestational ages. If prematurity is defined in terms of weight of the babies, the incidence of this abnormality was significantly less in the treated patients than in the controls. On the basis of week of delivery, on the other hand, there was no real difference between the two groups. Postmaturity was significantly less frequent in the stilbœstrol-treated patients than in the controls. The incidence of unexplained stillbirth was 1.1% in the controls and 0.5% in the treated group. This difference could have occurred by chance. There were 4 fetal deaths in the stilbœstrol-treated patients of 1.0% as against 21, or 3.8% in the untreated patients; a highly significant difference. This reduction in fetal mortality would appear to be due largely to two factors; (1) the lower incidence and later onset of toxæmia, and (2) the greater size and maturity of prematurely delivered infants.

A complete analysis of the data on the uncomplicated term pregnancies of the treated and control patients revealed no difference so far as the mothers were concerned (*e.g.*, length of labour, uterine inertia, intrapartum or postpartum bleeding, weight gain). Analysis of the data on full-term infants, however, revealed that significantly more babies of stilbœstrol-treated mothers weighed over eight pounds and were more than 21 inches long at birth. ROSS MITCHELL

A Survey of 113 Cases of Primary Dysmenorrhœa Treated by Neurectomy. Browne, O'D.: *Am. J. Obst. & Gynec.*, **57:** 1053, 1949.

In primary dysmenorrhœa there are definite nerve lesions in the presacral, the ovarian, or both systems. Menstrual pain can usually be relieved by appropriate and thorough nerve division. Eighty-two cases of surgically treated primary dysmenorrhœa who replied to a follow-up questionnaire were treated as follows: 21 ovarian denervations, 34 presacral sympathectomies and 27 combined ovarian and uterine denervations.

Menstrual pain of ovarian origin is determined by applying reasonably firm bimanual compression to the ovary. If the pain is of uterine origin the passage of a sterile uterine sound will cause pain accurately referred to the immediate suprapubic area in the midline of the lower abdomen. The technique for ovarian denervation consists of the simple division of both infundibulo-pelvic ligaments, their nerves and blood vessels and simple ligature of the stumps with catgut. The cut ends are sutured carefully to one another and, where necessary ovarian and uterine suspension has been performed, also appendectomy when indicated.

Twenty-one cases of primary dysmenorrhœa treated by ovarian denervation alone resulted in 17 full successes or 80.9%. Thirty-four cases of primary dysmenorrhea of essentially uterine origin were treated by presacral sympathectomy with 25 full successes or

73.5%. Incomplete presacral neurectomy or incorrect diagnosis are the commonest causes of failure. It is important to remove at least one inch of the individual nerve fibres or of the plexus itself. Seventy-six microscopical sections of nerves removed were examined. The changes constantly observed were (1) degeneration and destruction of sympathetic ganglion cells; (2) degeneration of postganglion fibres; (3) replacement fibrosis in the nerves.

The operations of presacral neurectomy and bilateral ovarian denervation do not endanger fertility. The author believes that our so-called civilization is the root of the evil of primary dysmenorrhœa and that if our young women led more normal lives fewer would suffer from menstrual discomfort. ROSS MITCHELL

Industrial Medicine

New Insecticides and Rodenticides and their Health Aspects. Thiemann, H. A.: *Am. Indust. Hyg. Ass., Quarterly,* **10:** 10, 1949.

Development of insecticides during the war, together with the uncovering of German chemical secrets after the war and, the further research in this country, has produced much information concerning the newer insecticides and rodenticides now on the market. In this article the author presents a review of the available data. As yet, most of the insecticides reviewed have not been thoroughly investigated, but extensive studies are under way in various parts of the country.

The insecticides are discussed in the following groups: halogenated hydro-carbons, organic phosphates, thiocyanates and piperines. Information is presented regarding their origin and development, their uses, and their health aspect. The halogenated hydrocarbons comprise the largest significant group. Of them, chlordane appears to be the most toxic, followed by chlorinated camphene and then the gamma isomer of benzene hexachloride (GHC). Most of the compounds in this group injure the liver. The hazards of aerosol formulations of chlordane, chlorinated camphene and the gamma isomer of benzene hexachloride can, as yet, only be surmised; every precaution should be taken in their use. The organic phosphate insecticides HETP, TEPP and Parathion, are freely absorbed from the gastro-intestinal tract following ingestion, and, in addition they are rapidly absorbed through the intact skin. Experiments conducted with laboratory animals have shown that this group of insecticides are highly poisonous compounds. Protective measures are outlined. It is stated in conclusion that insecticides must be evaluated as much for their harmlessness to man, domestic animals, cattle and vegetation as for their destructive effects on insects threatening human health and plant life.

MARGARET H. WILTON

Benefits from Professional Eye Care for Workers with Lowered Visual Performance. Morgan, W. G. and Stump, N. F.: *Indust. Med.,* **18:** 335, 1949.

In this article the authors discuss the Bausch and Lomb Industrial Vision Service with the Ortho-Rater as experienced by the Owensboro, Kentucky, Tube Works of General Electric Company. During the year and a half following its installation, an initial survey of the visual performance of all salaried and hourly employees was made. Details are presented regarding the method of investigations, the controls introduced, and, the relationship found between visual performance and training time on certain jobs. Figures are included to show employee ratings by foremen before and after eye care, and, decreased training time by increased visual performance.

As a result of the survey, 18 visual performance standards were established, setting forth the minimal visual requirements which experience has shown most desirable for new employees before being assigned to jobs. In addition, many additional facts about visual performance, previously neglected, were revealed. The direct relationship between visual performance and average hourly piecework earnings, and, the definite advantage to both company and employees when visual performance standards for various jobs are met, have been pretty definitely proved. It was found that those employees who met the visual standards for their jobs averaged from four to nine cents per hour more in hourly piecework pay than did their co-workers who had less than minimal visual skills or sub-minimal visual performance. Foremen and training inspectors reported that many more new employees than formerly, were efficient on the job. Correct eyesight meant less fatigue and greater comfort at the job.

In conclusion the authors list the ways in which the Industrial Vision Service has contributed most to both the employees and the company. Together with the greater efficiency and the increased earnings of those who met the minimal visual qualifications, attention is drawn to the fact that proof is now available that a new employee is, at least, visually qualified when he goes to his new job. Re-surveying can be done whenever the need is apparent. Training time is less when there is increased efficiency in visual performance, savings in learning time ranging from 12 to 35%. The visual performance tests form a very important part of the physical examinations. All applicants who have inefficient visual performance are urged to seek professional eye care; in this way many are salvaged and, subsequently brought up to the minimal requirements.

MARGARET H. WILTON

Radiology

The Rôle of the Radiologist in Mass Chest X-ray Survey. Editorial, *Radiology,* **53:** 274, 1949.

Attention is drawn to this editorial because tuberculosis is still the leading cause of death in the age group 15 to 45 and is the only one of nine leading causes of death that we possess the knowledge to eradicate. The introduction of chest x-ray surveys is an important factor in the public health problem of case finding. In addition to finding cases of active tuberculosis, a community-wide survey provides a base line for statistical proof of disease incidence and thus an accurate measure for the needs of a community for public health staff, sanatoria and hospital accommodation. The approval of organized medicine in a community is a basic requirement before the United States Public Health Service will assist mass chest survey projects. The physicians have aided in the organization of professional and technical phases of the campaign, have guided the lay staff, and assisted in controlling the publicity to prevent undue worry or misplaced security in the community.

Radiologists working on the professional committees should instruct the physicians in follow-up diagnostic procedures, case handling, availability of local nurse and social worker aid, the use and limitations of antibiotics and other timely topics. The radiologists have the further responsibility of reassuring the citizens and the medical profession that the interpretation of the films is as accurate as possible. The film readers should be especially trained, work in teams of four to six and cross-checking and informal consultations should be the rule. If there is any doubt in the diagnosis, the large x-ray films (14 x 17 inch) taken at the follow-up clinics, should be examined by a review board. The latter should be a voluntary organization of radiologists and other physicians interested in chest diseases. In Cleveland, Ohio, 35 radiologists and 20 chest specialists were formed into teams of two to three each, who rotated the duty of meeting twice a week to dispose of doubtful cases. This group confirmed the well known facts that there is a lack of standard terminology in pulmonary roentgenology and, even among qualified physicians, an inter- or intra-individual variation in film reading.

Thus the advent of community chest x-ray surveys imposes definite responsibilities on the radiologists. However, there is an opportunity to compare one's

opinion with other radiologists and chest physicians, whose approach to the problem of film diagnosis is somewhat different from their own. There is an opportunity to see a large number of widely differing anomalies, chest diseases, and their residua. Finally, an opportunity is afforded to participate in a worth-while health project with an expectation that present and future benefits may accrue to all the community.

J. F. SIMPSON

Value and Limitations of Aspiration Biopsy for Lung Lesions. Rosemond, G. P., Burnett, W. E. and Hall, J. H.: *Radiology*, **52**: 506, 1949.

The authors are convinced of the efficacy of needle biopsy in the diagnosis of malignant lesions of the lung and have used this procedure since 1936. They do not contend that all patients suspected of having pulmonary carcinoma should have needle biopsy but believe the method should be used when a definite diagnosis cannot be made by bronchoscopic biopsy or cytological examination. This method of investigation, performed with care and appreciation of the difficulties, is relatively safe. It is useless and dangerous to perform needle biopsy without a multiplane fluoroscope and a competent fluoroscopist and pathologist. Negative or questionably positive diagnoses should be disregarded and other diagnostic methods initiated.

The technique used in performing 272 aspiration biopsies on 231 patients is described; 220 of the patients were suspected of having bronchogenic carcinoma, not accessible to bronchoscopy and not proved by sputum examination. Of these 135 were proved by needle biopsy to have pulmonary carcinoma (61%) and another 28 proved by subsequent bronchoscopic biopsy or exploratory thoracotomy. There was one false positive, a lymphoblastoma, which was later proved at operation. The method is especially useful in soft carcinomata peripherally located in the lung, is of less value if the lesions cannot be definitely visualized, and of little use in calcified nodules, solid benign lesions or lymphoblastomata.

There were no instances of spread of the lesion along the needle track and no case of empyema, hæmorrhage or intravascular spread to the brain. Complications occurred in 20 cases (7.3%). Seven patients developed transient fever and chills. Two of the ten cases of pneumothorax were serious and one terminated fatally. Both of these cases had marked pulmonary emphysema and this condition is now considered a contraindication. Two other patients died shortly after the procedure; one from shock and the other from a cardiac lesion. Another patient died later of a cerebral metastasis.

J. F. SIMPSON

The Possibilities and Limitations of Roentgen Diagnosis: Pancoast Lecture. Rigler, L. G.: *Am. J. Roentgenol.*, **61**: 743, 1949.

The reliance placed upon roentgen study often goes far beyond or falls short of the merits of the method. There are definite maximal and minimal possibilities to the roentgen demonstration of abnormalities. Some limitations may be clearly defined and expressed in terms of relationship between roentgen signs to inception of the disease, to the onset of symptoms, or in a quantitative way. Relatively little has been written on the real significance of negative roentgenograms in various diseases. The limitations are particularly well illustrated in diseases of the thorax. The data presented in this study were derived from experimentation, from case study and from past roentgen history.

(1) Roentgen examination is a sensitive indication of the intra-alveolar type of œdema and is valuable before the onset of appreciable symptoms. Interstitial œdema is poorly demonstrated by roentgenograms. (2) A minimum of 100 c.c. of pleural effusion can usually be detected in the lateral decubitus position. Using the upright position fluid may not be apparent until it has reached 300 to 400 c.c. and physical findings are then already present. (3) Bacterial pneumonias are demonstrable, in some cases, within a few hours after the onset of symptoms and in practically all cases within twelve hours. (4) Atypical or virus pneumonias do not give distinctive roentgen manifestations for 24 to 48 hours after the onset of symptoms and the extent of pathological changes is not well demonstrated. (5) Chronic pulmonary tuberculosis is radiologically demonstrable in from ten to twenty weeks after the first exposure and in almost all cases, the roentgen findings precede the symptoms. (6) In a large percentage of the cases of acute miliary tuberculosis the roentgen findings may be completely absent for as long as seven weeks after the onset of symptoms. In some cases the characteristic findings will appear within a week or ten days. (7) Radiological evidence of nodular pulmonary metastases invariably precede signs and symptoms and are usually demonstrable when their size is three millimetres or more in diameter. Miliary metastases may not be seen until they are very numerous or large in size. (8) In many cases of primary bronchogenic carcinoma, roentgen findings are evident when the patient is apparently well and are invariably present if the patient has symptoms. An absence of roentgen changes, in the presence of respiratory signs and symptoms, usually indicates an inadequate examination or lack of appreciation of relatively minor changes in the normal lung pattern. The author emphasizes that more attention should be given to three important roentgen signs, none of which are pathognomonic of bronchogenic carcinoma but each of which should lead to further investigation. These signs are unilateral enlargement of the hilar shadow in a symptomless individual; an area of density in the periphery of the lung which may be round and sharply defined or irregular and poorly defined; and minor changes in the lung indicative of early emphysema and atelectasis.

J. F. SIMPSON

OBITUARIES

Dr. Henry Graham Arnott died on April 28. He had conducted a private medical practice in Hamilton and for some 15 years had been company doctor at the J. R. Moodie Company, Limited. He had been retired since 1940. Born in Arva, near London, Ont., he was a graduate of the University of Western Ontario. After his graduation Dr. Arnott joined in a medical partnership with his father for some years. Together with the late Owen Merriman, Dr. Arnott was one of the chief workers in having the Dundas Marsh made a game preserve and bird sanctuary. He was a founder of the Bird Protection Society of Hamilton, now defunct. Interested in bird protection since his youth, he had been associated with E. W. Saunders, one of the leading ornithologists on the continent, and the famed Jack Miner of Kingsville. He is survived by his widow, and one brother.

Dr. Boris P. Babkin, internationally-famous physiologist, died suddenly on May 3 on the train that was bringing him home from Atlantic City. Dr. Babkin was returning from the annual meeting of the American Gastroenterological Association when he was stricken. He was 73, a widower, and lived at the Faculty Club, Montreal.

Dr. Boris Petrovitch Babkin was born in Russia in January, 1877 and graduated with the degree of Doctor of Medicine from the Military Medical Academy at St. Petersburg (Leningrad) in 1904. In 1925 he received the degree of Doctor of Science from the University of London. From 1901 to 1912 he assisted the internationally-known physician Professor I. V. Pavlow of Russia at the Institute of Experimental Medicine in St. Petersburg, and from 1912 to 1915 he was professor of animal physiology at Novo Alexandria Agricultural Institute and from 1915 to 1922 he was professor of physiology at the University of Odessa.

Ordered to leave Russia by the Bolsheviki he went to England in 1922 and for two years he was associate of the Medical Research Council in London, working with Professor Steeling of University College. He came to Canada in 1924 to assume the chair of physiology at Dalhousie and remained there for four years, being appointed to McGill University in May, 1928, as research professor of physiology. In January, 1940, he was appointed acting chairman of the Department of Physiology during the illness of Dr. John Tait, and in September of the same year was appointed chairman of the department. In 1942 Dr. Babkin retired from his post but remained as research professor of physiology. At the time of his death he was research fellow in the department of neurology and neuro-surgery.

In September, 1943, Dr. Babkin was awarded an honorary degree of Doctor of Laws at a special convocation at Dalhousie University, Halifax, and in 1949 he was awarded the Julius Friedenwald Medal by the American Gastro-Enterological Association in recognition of the contributions made by him to gastro-enterological physiology. This is the highest honour in this field and was presented to him at a dinner of the association in New York on June 4 last.

Dr. Babkin was the author of numerous important medical works, and has contributed more than 100 papers on the physiology of gastro-intestinal secretion and motility. He was a member of various physiological associations in Britain and the United States and was an accomplished linguist. He was a Fellow of the Royal Society of Canada and holder of the Flavelle medal. He is survived by a granddaughter, Mrs. Helene Kernan.

Dr. Grant L. Bird, aged 54, died on April 27 while attending a medical convention in Chicago.

A Fellow of the American College of Surgeons and certified as a surgery specialist at the Royal College of Physicians and Surgeons in Canada, Dr. Bird was a graduate of the University of Toronto. Born at Stirling, near Trenton, he taught public school for several years after graduating from high school and spent two years with the civil service before returning to school to study medicine. He practiced one year in Whitby after graduation and came to Oshawa in 1923. For the past 15 years Dr. Bird has been plant surgeon for General Motors of Canada here.

Erection of the Oshawa clinic here last year culminated many years' work on the part of Dr. Bird who developed the plan. Long interested in public affairs, he was chairman of the board of education at the time of his death. He was a member of city council for two years and a Conservative candidate for the provincial legislature in the 1937 elections. Dr. Bird was past president of the Ontario County Medical Association and of Oshawa General Hospital's Staff Association. He was also past president and past district governor of the Rotary Club here. Besides his widow, Dr. Bird is survived by two sons.

Dr. Jeremiah Simpson Clark, aged 78, died recently in Regina. During the war, when Grenfell was without a doctor, he gave his services here for a time, but was finally forced to retire due to ill health. Born in Cavendish, P.E.I., Dr. Clark was educated at Prince of Wales College, Charlottetown. He received his bachelor of arts degree from Acadia University in 1889 and graduated from Manitoba Medical College in 1909. Dr. Clark began private practice in Brandon in 1913, living there until his retirement in 1941. In the First World War he served overseas with the Royal Canadian Army Medical Corps and on his return worked untiringly for the welfare of veterans. Dr. Clark was a former member of the board of governors of Brandon college and past president of the Rotary and Canadian Clubs of that city. For many years he was a member of the board of deacons of First Baptist Church there.

Dr. Howard R. Clouston died suddenly at Huntingdon, Que., on April 19, in his 62nd year. Dr. Clouston, who served as general practitioner in this region for more than 30 years, was born in Howick in 1889. He was educated at Huntingdon Academy, and graduated in medicine in 1911 from McGill University. He served his internship at the Montreal General Hospital. During the First World War he served overseas with the Royal Canadian Army Medical Corps, acting at one time as medical officer of the 6th Duke of Connaught Royal Canadian Hussars. In 1919 he returned home and began his private practice. He also found time to carry out some private research, particularly on hereditary ectodermal dystrophies. He was created a Fellow of the Royal College of Physicians (Canada) in 1931. Dr. Clouston was a member of the board of directors, Barrie Memorial Hospital at nearby Ormstown. He was a member of the Montreal Medico-Chirurgical Society; and past-president and member of the Quebec division of the Canadian Medical Association. He was a past-master of the Chateauguay Lodge; past first principal of the Union Chapter; and past provincial grand superintendent of R.A.M.

He is survived by his widow, a son and a daughter.

Le Dr J.-Emile Desrochers, ancien président et gouverneur du collège des médecins et chirurgiens de la province de Québec, est décédé, le 19 avril après une courte maladie. Le Dr. Desrochers, qui avait été médecin en chef de la compagnie La Sauvegarde, était né à S.-Jérôme. Gradué de l'université Laval, il avait été interne à l'Hôtel-Dieu pendant 4 ans. Il avait pratiqué la médecine à Chambly, à Montréal et à S.-Boniface, Manitoba, où il s'étai associé à la compagnie d'assurance. Pendant plus de 20 ans, il avait été rédacteur de la revue L'Action Médicale. Outre sa femme, il laisse deux filles.

Dr. Mercier Fauteux, aged 53, internationally known for his research work on heart disease, died at his home early on April 28, following a brief illness. Dr. Fauteux was a brother of Hon. Gaspard Fauteux, former speaker in the House of Commons, and Mr. Justice Gerald Fauteux of the Supreme Court of Canada.

Dr. Leslie Heuther was killed on April 26 in an auto accident at Phoenix, Arizona. Dr. Heuther had lived in Phoenix for the past year. A graduate in medicine from the University of Toronto, Dr. Heuther was at the Hospital for Sick Children during the middle '20's. Later he was appointed surgeon-in-chief at the Shriner's Hospital for Crippled Children in Salt Lake City. Dr. Heuther remained there until a year ago. He is survived by his widow.

Dr. Alvin Martin, medical practitioner in Toronto for 30 years, died Friday evening at his home, of coronary thrombosis. He was in his 73rd year.

Dr. Martin was born at Lawrence, Elgin County. He graduated in medicine from McGill University in 1908 and practised in Pierce, Neb., for four years. He was a veteran of the First World War. Joining the R.A.M.C., he served for three years in Mesopotamia and one year in India. He was a member of University Lodge, A.F. & A.M., and Kimbourne Park United Church. He leaves his widow, one sister and one brother.

Dr. Gordon W. McCormack died on April 13 in Toronto in his 65th year. He was on the staff of Toronto Western Hospital and active until two years ago when he developed a heart condition. Born at Vivian Ont., he was educated at Markham High School and the University of Toronto, graduating in 1907. He was a Mason and belonged to the Odd Fellows, Orange Order and Black Preceptory. A bachelor he is survived by four brothers and a sister.

Dr. Harry F. McKendrick, aged 84, former world champion canoeist, died at his home on April 30, of a heart attack. Born in Galt, he started practising here in 1893 and was a veteran of the Medical Corps in World War I. In 1890 he won the world's canoe championship at Long Island, N.Y. In 1888 he won the Canadian championship and in 1886 the U.S. title.

Dr. Hollie H. McCormick McKinnon, aged 51, wife of Dr. Neil McKinnon, died suddenly on April 29, in Toronto. Born in Virginia, she came as a girl to Toronto, where she received her education. She graduated in medicine from the University of Toronto. Dr. McKinnon was married shortly after her graduation. Latterly she had been associated with the health services of the University of Toronto. She was at one time a member of the board of the Haven. She leaves, besides her husband, three daughters.

Dr. George A. Ramsay died in Toronto on April 10. He had suffered a stroke in July, 1948, which had forced him to quit his practice and active participation at the University of Western Ontario Medical School, where he was professor of orthopædic surgery. Born on a farm in London Township, Dr. Ramsay spent most of his life in London. He attended the old London Collegiate Institute and was a 1910 graduate of the University of Western Ontario Medical School and four years later became associated with the faculty of medicine. From then, except for the years of 1915-1919 when he served in the First World War, he was a member of the faculty. His activities in medical organizations included 14 years as member of the education committee of the Ontario College of Physicians and Surgeons and presidency of it in 1946 and 1947. He was a charter member of the Canadian Society of Orthopædic Surgeons and wrote many articles for medical journals. He was a Fellow of the Royal College of Surgeons of Canada and a Fellow of the American College of Surgeons. Beside his widow he leaves one son, Dr. Allan Ramsay, Montreal.

Dr. Donald G. Russell, aged 87, died in Seattle on April 1. Dr. Russell came west during the construction of the Great Northern Railway and practised in Spokane from 1899 to 1910. He later founded a transfer and storage company here. A native of Morrisburg, Ont., he graduated from Queen's University, Kingston.

Dr. Albert James Skelley died on April 2 in Ottawa. He had been in ill health for the past year, and died in his 58th year. A resident doctor of Pembroke since 1933, Dr. Skelley had been medical officer of health for the town from 1941 to the time of his illness. Born at Wendover, Ont., he came to Ottawa with his parents at an early age where he received his education in Ottawa schools and the University of Ottawa. During World War I he served overseas for four years, and returned to Canada where he entered McGill University to study medicine, graduating in 1924. He came to Pembroke in 1933 and had latterly resided at 243 Isabella Street. During World War II, Dr. Skelley served as a medical officer at Petawawa Military Camp where he held the rank of major. His widow survives him with one son and three daughters.

Dr. Don W. Stewart, of Sudbury, died suddenly on April 21, while attending a medical meeting in Boston. He was in his 42nd year.

A member of the Sudbury District Medical Association, he was a member of the medical staff of St. Joseph's Hospital. A graduate with his B.A. degree from the University of Saskatchewan in 1928, he received his medical degree from the University of Toronto in 1933, and served his internship at Riverdale Isolation Hospital and Western Hospital, in Toronto, coming to Sudbury in 1937. He became associated in medical practice with Dr. S. S. Polack, at the Sudbury Clinic, and latterly had become an outstanding diagnostician. In addition to his medical work Dr. Stewart was active in community undertakings. A past president of the Sudbury Kiwanis Club, he was also a member of Knox Presbyterian Church. He was a member of Masonic Nickel Lodge No. 427, A.F. & A.M., a member of Masonic Tuscan Chapter No. 95 and a member of Mavar Preceptory. Besides his widow, Dr. Stewart is survived by three small children.

Dr. Thomas F. Thomson died on March 25, at Chatham, Ont., following a serious illness of over two months' duration. He was born in Chatham and attended local public schools and C.C.I. He graduated from Wayne University, College of Medicine, Detroit, and was assistant surgeon in the Veterans' Hospital in Milwaukee, Wisconsin, serving on the Board of Health in Milwaukee for a number of years. Upon his retirement Dr. Thomson came to Chatham to make his home. He attended St. Andrew's United Church and took a keen interest in all religious and patriotic work. His widow survives him.

Dr. David Fergus Webster died on April 20, in West Lorne at the age of 85 years, following a four months' illness. It was not until late last year that he had to discontinue his long practice and was confined to his bed.

Dr. Webster was a doctor of the old school in every sense of the word. He belonging to the age and era when a general practitioner was expected to get out at any hour of the day or night, in every month of the year and in every kind of weather, to respond to calls. It was said of Dr. Webster that he was never known to refuse a call no matter how bad the weather might be, how terrible the condition of the roads, or what the circumstances of the people who required his services were. He was a humanitarian first; a good doctor next. Born near Strathburn, in Mosa Township, he attended School section No. 1, Mosa. Dr. Webster was preparing to make teaching his life work and had taught about nine months at School Section No. 11, Aldborough Township, when his father asked him one night if he would like to study medicine. That ended Dr. Webster's teaching career early in 1887 and he went to Toronto to enter the Toronto School of Medicine. Four years later, in 1891, he graduated as a doctor.

As a younger man, Dr. Webster took a keen interest in community work and service. Before West Lorne, formerly Bismark, became an incorporated village he served on the police village board of trustees for several years. He was a public-spirited man, always interested in the good and welfare of West Lorne and Aldborough Township. He was prominent in the Masonic Order, being a fifty-year past master of McCall Lodge of West Lorne; a member of the Lorne Chapter Royal Arch Masons; a past district grand master, and a 32nd Degree Mason. He was also active in the United Church of Canada, being an elder in the West Lorne Church and a member of the board of stewards. Surviving is his daughter.

Dr. William Albert Whitelaw died in Vancouver on April 15. He was in constant demand by associates for advice on difficult cases, and probably was consulted by more doctors concerning their own families' health than any other physician in British Columbia. Born in Meaford, Ont., he graduated from McGill University with a brilliant record and came to Vancouver General Hospital in 1907 for his internship. Two years later he was appointed superintendent of the hospital and served until 1912, when he opened his own practice. He was known as a discerning diagnostician and a wise counsellor in care and treatment. Surviving are his widow, two sons, and a daughter.

NEWS ITEMS

Alberta

Dr. J. W. Richardson of Calgary was elected President of the Council of C.P. & S. Alta., while Dr. D. N. McCharles was elected Vice-President. Dr. McCharles is associated with The McCharles Clinic in Medicine Hat.

Sir Henry Dale presented the first Tisdall Lecture to the Edmonton Academy of Medicine at a special meeting of that body on May 5, whose President is Dr. R. K. Thompson. Sir Henry gave an inspiring address upon the subject of Chemotherapy, drawing a vast amount of knowledge from his wide experience in research in this field, he outlined the early work by other pioneer men beside himself who were responsible for our present day knowledge and advantages of these antibiotics.

The President-elect of the Alberta division of the C.M.A., Dr. P. H. Sprague with Dr. T. C. Michie, Dr. O. Rostrup and Dr. W. Bramley-Moore have completed a tour of the medical districts of Alberta. The meetings were well attended in the districts visited.

Dr. G. R. Davison and Mrs. Davison have returned from their recent trip to Australia, where Dr. Davison attended a meeting on Silicosis and allied lesions. The trip was made by air from San Francisco.

Dr. Roy L. Anderson is taking a surgical tour and postgradute work of several months in England. Dr. Anderson will spend some time in Oslo, Stockholm and Copenhagen while London, Manchester and Edinburgh will take up a period of his time. Dr. and Mrs. Anderson expect to return to Edmonton in the fall.

Dr. Graham Huckell, Professor of Orthopædic Surgery at the University of Alberta has returned from a sojourn in Jamaica and is attending his duties after the refreshing vacation.

Dr. Angus C. McGugan is recuperating from a fracture of an arm which he sustained while attending the Hospital Convention in Winnipeg recently. Dr. McGugan is the Superintendent of the University of Alberta Hospital.

A feature of the Alberta annual meeting this year will be an exhibition of the hobbies carried on by the medical men of the Province. There is expected to be a wide variety of "past-time" work presented at the Calgary meeting in the fall.

W. CARLETON WHITESIDE

British Columbia

Dr. Lynn Gunn, till recently Medical Superintendent of Shaughnessy Military Hospital in Vancouver, has accepted the position of Executive Secretary of the B.C. College of Physicians and Surgeons, and will take office immediately. He takes the place of Dr. F. L. Whitehead, who resigned a short time ago. Dr. Gunn's appointment is regarded by all who know him as an excellent one. He has had considerable experience in organization, and has had a long and distinguished military career, having served in both World Wars, in the first as a combatant, and in the second as a medical officer. He has had many years of medical practice, and thus is well acquainted with the problems of the medical practitioner. He is a graduate of Manitoba (1926).

Dr. Frank A. Turnbull of Vancouver, where he is a well-known specialist in neurosurgery, has recently been made President of the Harvey Cushing Society—the largest Neuro-Surgical Society in North America. This is a signal honour, and especially gratifying to us as Canadians, as there are only seven Canadians among the large membership of the Society. He gave his presidential address this month at Colorado Springs, where the annual meeting of the Society was held.

Dr. A. M. Gee, of the Staff of Essondale Mental Hospital has been made Medical Superintendent of that institution, succeeding Dr. A. L. Crease, who recently resigned the position. Dr. Gee is eminently fitted for this appointment, having served on the staff for many years, and having acquired a very high reputation by the outstanding character of his work.

The Annual General Meeting of the Registered Nurses' Association of B.C. was held at Kelowna this month, under the presidency of Sister Columkille of the staff of St. Paul's Hospital in Vancouver. The convention lasted for three days, and was very largely attended. A well-designed educational and scientific program was presented, and all the main training schools of the Province were represented by their superintendents of nursing and nursing directors.

The newspapers of B.C., and especially those of the lower mainland have been carrying very full accounts of the ravages of a poultry disease known as Newcastle disease, which has been working havoc among the poultry flocks of the area. One flock in Burnaby of 6,000 birds, valued at $17,400, had to be destroyed, as have many other smaller flocks. The disease is apparently of a virus type, and has spread very rapidly, but the latest advices state that it is under control, owing to the vigorous measures taken by the provincial authorities. An unfortunate result of this publicity has been the totally unnecessary alarm that has been engendered in the minds of many of the public, as rumours began to spread that polio and other diseases might be spread by infected eggs. The Public Health authorities, however, have dealt firmly with these rumours, and have published the true facts of the case, so that this alarm has been pretty well dissipated.

The Provincial Public Health Institute held a four-day meeting in Victoria this month. Dr. George Elliott, assistant Provincial Medical Health Officer, described the progress being made against cancer in this province: he told of the new free biopsy service started in February of this year by the Government; of the extensions of consultative service by the new department of the Cancer Institute, and of the additions to diagnostic x-ray service being installed in Hospitals throughout the Province.

A joint conference of scientific bodies in the province was held during April at the University of British Columbia, under the sponsorship of the B.C. Academy of Sciences, which had as associates at the Conference the B.C. Psychological Society, the Phytopathological Society, the B.C. Institute of Agrologists, and the Chemical Institute of Canada. This is the fourth annual B.C. Conference of the kind and it is becoming a recognized institution in the scientific world of the province.

Programs for the forthcoming Annual Summer School of the Vancouver Medical Association from May 29 to June 2, are now completed, and the Committee in charge has secured an excellent list of speakers and clinicians. The following will be the visiting speakers for this year. Dr. A. L. Chute, Pædiatrician, Sick Children's Hospital, and Associate Professor, Banting and Best Department

of Clinical Research, University of Toronto. Dr. Howard P. Lewis, Professor of Medicine, University of Oregon Medical School, Portland, Oregon. Professor J. Chassar Moir, Nuffield Department of Obstetrics and Gynæcology, Radcliffe Infirmary, Oxford, England. Dr. R. L. Sanders, Associate Professor of Clinical Surgery, University of Tennessee, Memphis, Tenn. Dr. Meyer Wiener, Honorary Consultant in Ophthalmology, Bureau of Medicine and Surgery, United States Navy, Coronado, California.

J. H. MACDERMOT

Manitoba

On the occasion of Dr. J. H. Fraser's 84th birthday, he and his wife were entertained at the home of his daughter, Mrs. J. M. Scurfield of Winnipeg. Dr. Fraser practised at Crandall for 47 years.

Dr. G. Stuart Musgrove of Winnipeg left by air early in April to accept a post as specialist in Obstetrics and Gynæcology in the Department of Health of Iraq. He graduated from the University of Manitoba in 1935 and in the same year was commissioned in the Royal Army Medical Corps and later transferred to India where he spent eight years. Following postgraduate work in Belfast and London, Dr. Musgrove returned to Winnipeg two years ago and served on the honorary attending staff of the Winnipeg General Hospital.

The five-storey Maternity Pavilion of the Winnipeg General Hospital was opened to the public for inspection on April 26.

The General Practitioners Association has offered to the University two cash prizes of $150 each year. The first awards will be made this year to students who intend to enter general practice after graduating. One will be presented to an intern in fifth year medicine at the Winnipeg General Hospital, the other to an intern in St. Boniface Hospital.

Dr. J. A. Hildes, Assistant Professor of Physiology and Medical Research, University of Manitoba, has been selected to receive a Medical Research Fellowship from the National Research Council. Dr. Hildes is working on a new method to detect early disease in the liver.

Sir Henry Dale, O.M., F.R.S., F.R.C.P., addressed the doctors of Greater Winnipeg and the Scientific Club on "Histamines and Antihistamines". This was the second Tisdall Memorial Lecture.

Dr. K. I. Johnson who has practised for more than ten years at Gimli is leaving to take up duties at Pine Falls, Manitoba. In honour of him and his family more than 400 people gathered at the Parish Hall in Gimli to bid them farewell. A presentation was made by Mayor Barney Egilson of Gimli on behalf of the gathering. Speakers at the party included Dr. S. O. Thompson, M.L.A., Riverton, Dr. F. E. Scribner of Winnipeg Beach. Dr. Johnson and his wife have been active in almost all the local organizations. Dr. Johnson is vice-president of the Icelandic celebration committee which this year is sponsoring Gimli's 75th anniversary.

The floods in the Red River have caused widespread suffering and enormous destruction of property. Two lives have already been lost from drowning. St. Boniface Hospital was evacuated on May 6 and the Municipal Hospitals, King Edward, King George and the newly completed Princess Elizabeth were compelled to move their patients to Deer Lodge Veterans' Hospital. The new Maternity Pavilion of the Winnipeg General Hospital was opened on May 6 and this has been a blessing so far as maternity patients are concerned. The patients in the Children's Hospital were moved to the Red Cross building at Deer Lodge on the evening of May 8. The Red Cross is doing valiant work to relieve destitution. The spirit of the people in the Red Deer Valley has been admirable, and Manitoba is very grateful for the assistance that has already been rendered generously by other provinces. The crest of the high water coming from Minnesota and North Dakota is not expected to reach Winnipeg until May 13 and to add to the misery of the situation the weather has been decidedly unpropitious with repeated rain, snow and high winds. To avoid a widespread epidemic from contaminated water, antityphoid inoculation is being carried out on a very large scale.

ROSS MITCHELL

New Brunswick

Dr. Samuel Silver of the nose and throat staff of the Saint John General Hospital, attended the annual postgraduate course in anatomical and clinical otorhinolaryngology at the Indiana University centre in Indianapolis.

Dr. S. H. Holloway, who has lately practised at St. Andrews, has left to begin a new practise at Didsbury, Alberta.

Dr. R. I. McKenna, of Moncton, has returned from a surgical course at the Cancer Memorial Hospital, New York, sponsored by the N.B. Branch of the Canadian Cancer Society.

Dr. A. E. Macaulay, retired senior surgeon of the Saint John General Hospital will move to Owen Sound, Ontario, in the near future.

Dr. Lachlan MacPherson, of the staff of the Saint John Tuberculosis Hospital, has completed a course of instruction, arranged by the American College of Chest Physicians at Philadelphia.

Dr. R. T. Hayes, of Saint John and Dr. P. J. Desmond of Moncton, attended the Gill Postgraduate week course in Eye, Ear, Nose and Throat subjects at Roanoke, Virginia.

Dr. Norman Skinner of Saint John, attended the meeting of the American College of Physicians at Boston as acting Governor for the Maritimes. Other New Brunswick physicians attending the same meeting were Dr. R. D. Roach of Moncton, and Dr. A. L. Donovan and Dr. Robert Washburn, of Saint John.

Dr. R. A. H. MacKeen, New Brunswick Provincial Pathologist has been appointed associate professor of Pathology by Dalhousie Medical School as an extra mural faculty member at Saint John.

Dr. Gordon Gaulton was the special speaker at the April meeting of the Saint John Medical Society. The title of his paper was "Deafness", at the conclusion of the address and discussion a film showing details of the fenestration operation was enjoyed. At this meeting there was much discussion of the new departure in D.V.A. policy whereby self supporting veterans, who are ineligible under existing regulations may be treated in D.V.A. Hospitals—no immediate evidence of support for this apparent invasion of private practice appeared in the discussion.

Dr. R. D. McKay, of Vancouver, who has just completed his intern year at the Saint John General Hospital, received the Murray MacLaren Memorial Prize, awarded yearly to the intern who has shown the greatest increase in practical knowledge and gives the best service to the hospital and to patients and to his profession.

The administration of the Hotel Dieu Hcspital at Edmundston has appointed a special committee composed of Dr. E. A. Martin, Dr. C. J. Gauthier and Dr. L. E. Belanger, to regulate the practice of surgery in the hospital.

A. S. KIRKLAND

Newfoundland

The St. John's Clinical Society held two meetings this month. At the first meeting Dr. Conroy spoke on Spastic Paralysis in Children, Dr. Marshall, on Nonunion of Fracture, and Dr. Maher on Bone Tuberculosis. The second meeting was held at the St. John's General Hospital where Dr. T. G. Anderson spoke on Pyelitis in Children and Dr. B. J. Maher spoke on Enuresis.

It was announced recently that the Federal Government will contribute over $63,000 toward the cost of construction of the Western Memorial Hospital, Corner Brook.

Dr. Cunningham is planning to take up general practice in Burgeo. Until recently he practised at Trinity.

Representatives of the United States Government are presently meeting with Newfoundland officials to discuss the construction of a Memorial Hospital at St. Lawrence by the Department of the United States Navy. This Memorial Hospital will be presented to the people of St. Lawrence as a token of appreciation of the heroic services of the people of this settlement, in saving the lives of officers and men of two naval vessels, the *U.S.S. Polleux* and the *U.S.S. Truxton*, wrecked near St. Lawrence in 1942.

Dr. L. Miller, Deputy Minister of Health, will be one of the Canadian delegates attending the World Health Assembly at Geneva.

Dr. F. D. Gill has resumed practice in the Brigus area. The doctor was hospitalized for some time due to injuries received in a motor accident. His friends will be glad to hear he has returned to usual good health.

J. B. SQUIRE

Ontario

Dr. Eric A. Linell has been elected president of the Academy of Medicine, Toronto. Fellowship of the Academy numbers 1,670.

Dr. Douglas Cannell has been appointed professor of obstetrics and gynæcology, University of Toronto and obstetrician and gynæcologist-in-chief of the Toronto General Hospital. A native of Port Carling, Dr. Cannell graduated from the University of Toronto in 1927 and later did four years' graduate work in obstetrics and gynæcology at Western Reserve University, Cleveland. Returning to Toronto he served on the staff of Toronto Western Hospital until the outbreak of war. Following overseas service he returned to university teaching. Dr. H. B. VanWyck has been named professor emeritus and will continue to lecture on the history of medicine.

Dr. Robert Cameron Harrison who came to Toronto from University of Alberta and has held an appointment as fellow in the Department of Surgery for the past year has been awarded the Reeve prize given annually for the best scientific research by one who has held a staff appointment for less than five years. The award was given for his motion picture made with the help of microscope showing what happens in a living blood stream in response to certain chemical and physical reactions. His colleagues in the project were Dr. W. G. Bigelow and Dr. R. O. Heimbecker.

Dr. Harris McPhedran and Mrs. McPhedran with Dr. T. C. Routley and Mrs. Routley have gone to Australia by way of England, India and China to represent Canada at the Commonwealth Medical Conference.

A lecture series in Canada's twelve medical schools has been established in memory of Dr. Fredrick F. Tisdall of the University of Toronto. Dr. Tisdall, an authority on nutrition, died April 23, 1949. This series was made possible by a grant from Merck and Company Limited, manufacturing chemists. The lectures started at University of British Columbia, with Sir Henry Dale as lecturer. Sir Henry is known for his researches on histamine and anti-histamines, on acetylcholine and on the mode of action of insulin. He will later speak at midwestern and eastern universities before leaving for England the end of May.

Dr. Chassir Moir, professor of obstetrics and gynæcology at Oxford, now on exchange with Dr. Robertson of Queen's spoke on The Treatment of Vesicovaginal Fistula at the May meeting of Women's College Hospital staff.

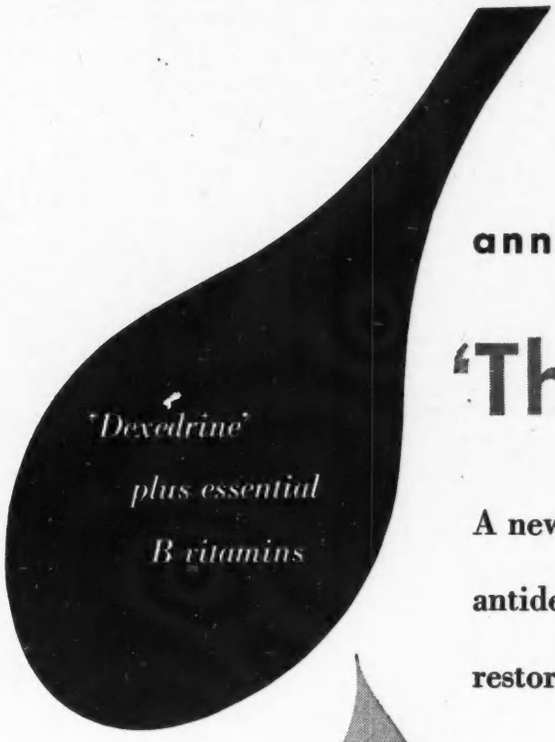
Ontario objective in the first widespread appeal of the Canadian Arthritis and Rheumatism Society is $400,000. Mr. John Proctor, assistant general manager of the Imperial Bank of Canada is the provincial campaign manager. Dominion objective of the appeal is $850,000. The money will be used for research fellowships, to establish and extend clinics, for mobile units to bring physiotherapy treatment into homes of patients and for experimental projects in rehabilitation.

Canada's third course in civil aviation medicine lasting a week was given in May at Toronto. The course is conducted by the Federal Department of Health for the benefit of civilian physicians appointed by the Transport Department as aviation examiners. Thirty-seven physicians enrolled this year. Dr. H. E. Wilson who conducts the course said that 96 of the 220 physicians holding Canadian aviation appointments have been through the course.

In 1949 the Ontario Workmen's Compensation Board handled 48 claims from the victims of silicosis. There were 179,894 industrial accidents including 311 fatalities reported to the Board last year.

Award of four Medical Alumni scholarships worth $200 each has been announced. The winners are: C. D. Anderson, G. Y. Hiraki, W. D. Friend and D. A. Smith. The Association also awarded four bursaries of $100 each. Next year there will be six $200 scholarships and four $100 bursaries. The scholarships are maintained by annual contributions from graduates scattered all over the world. Other interests of the association are the postgraduate refresher course held every fall, the round table discussion on general practice for final year students and interns, the annual dinner to final year students and to the graduating class of fifty years previously and the sponsoring of alumni gatherings. Dr. Ernest J. Clifford is chairman of the scholarship fund and Dr. T. G. Heaton is president of the Association.

LILLIAN A. CHASE



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At the 85th meeting of the College of Physicians and Surgeons of Ontario, Dr. Ward Woolner, of Ayr, Ont. was elected President and Doctor J. F. Sparks of Kingston, Vice-president.

The Toronto East General and Orthopædic Hospital has been awarded $206,000 from the federal hospital construction grants to aid in meeting the costs of its new west wing, already under way. The new wing will provide space for 170 more beds and a 108-bassinet nursery. Two more wings are planned.

A federal grant of $45,275 has been made for additional scientific equipment for the Central Laboratory of the Ontario Department of Health. $4,150 has been allotted for new operating equipment for the Ontario Hospital, Whitby.

On April 4, the Academy of Medicine, Toronto, held the Annual Library and Historical night. Mr. Herbert Baldwin of Toronto, presented to the Academy the Minute Book of the Board of Health of the Town of York, 1832. Dr. R. I. Harris gave a very interesting description of the Cholera Epidemic of 1832, illustrated by quotations from the Minute Book.

The Civic advisory committee on hospitalization of the City of Toronto, recommended payment to five Toronto hospitals claiming deficits for indigent patients' treatment. St. Michael's will receive $99,622, Toronto General Hospital $263,584, Toronto Western Hospital $129,609, Mt. Sinai Hospital $6,114 and St. John's Convalescent Hospital $5,650. NOBLE SHARPE

The University of Toronto, Faculty of Medicine announces renewal of the Canadian National Institute for the Blind Fellowship in Ocular Genetics. The grant is $2,000.00 for research in this field. This Fellowship was held during 1949-50 by Dr. L. A. Probert of Moose Jaw, Sask., who has been carrying on studies of the hereditary aspects of glaucoma. Dr. G. A. Thompson of Richmond Hill, Ontario has been appointed to continue these studies next year through funds provided by this Fellowship.

Quebec

La Société de Pédiatrie de Montréal a inauguré les 25, 26, et 27 avril derniers les premières journées pédiatriques de Montréal. Elles étaient tenues sous le haut patronage du ministre de la santé, l'honorable Albin Paquette, du doyen de la Faculté de médecine, le professeur Edmond Dubé, des professeurs Gaston Lapierre et J. A. Leduc et présidées par le président actuel de la Société le docteur Paul Letondal. Des séances cliniques et des travaux scientifiques furent présentés dans trois institutions de Montréal, les hôpitaux Ste-Justine, Pasteur et Notre-Dame.

La Société canadienne d'arthrite et de rhumatisme a accordé des bourses d'études à cinq autres médecins canadiens, dont les docteurs Raymond A. Hughes et Roger Demers de Montréal.

Le Comité provincial de défense contre le tuberculose a organisé un cours de perfectionnement qui a été donné à l'Université de Montréal au début du mois de mai. Des phtisiologues reconnues de L'American Trudeau Society, dela Montréal Medico-Chirurgical Society, des sociétés de Phtisiologie de Québec et de Montréal, des membres du Ministère de la Santé du gouvernement provincial et de l'Association Canadienne Antituberculeuse, y ont pris part.

Le docteur Paul David, cardiologue à l'hôpital Notre-Dame, vient d'être nommé membre correspondant de la Société de Cardiologie de Paris.

YVES PRÉVOST

We learn with great pleasure that the "Semaine du Praticien" which was held at l'Hôpital de l'Enfant Jésus, Quebec, in April last, was an outstanding success. The attendance rose far above expectations, and there was no doubt of the keen desire of the visitors to take advantage of the program offered. Many problems connected with general practice were dealt with.

It is hoped that the "Semaine Praticien" will become a regular feature each year.

The combined hospital campaign for funds is now in full swing in Montreal. This campaign has been initiated by three hospitals, the Montreal General Hospital, the Children's Memorial Hospital, and the Royal Edward Laurentian Hospital, and is designed to cover an extensive program of building and expansion. The campaign is unique not only in its embracing the needs of three hospitals at once, but in its financial aim, which is a total of $18,000,000. The raising of such a large sum has called for prolonged and careful planning and organization, and judging by the very large sum already raised amongst the medical staff of one of the hospitals alone, there are good hopes of success.

Saskatchewan

A series of district medical society meetings are being arranged for the Province of Saskatchewan to take place from May 17 to June 14. The program is to consist of scientific discussions of professional problems and motion pictures. Meetings will be held in Swift Current, Moose Jaw, Weyburn, Whitewood, Yorkton, Tisdale, Prince Albert, North Battleford, Rosetown and Saskatoon.

The formal opening of the Medical Building, University of Saskatchewan took place in the auditorium at the University on Monday, May 8, 1950. The Honourable T. C. Douglas, Premier of Saskatchewan, was the guest speaker for the occasion.

Following the opening ceremonies a tea was held at the Medical Building so that the building could be inspected by all interested persons.

In connection with the formal opening, Sir Henry Dale, past President of the Royal Society and the Royal Society of Medicine delivered the First Tisdall Lecture in the Medical Building on the evening of that day.

G. G. FERGUSON

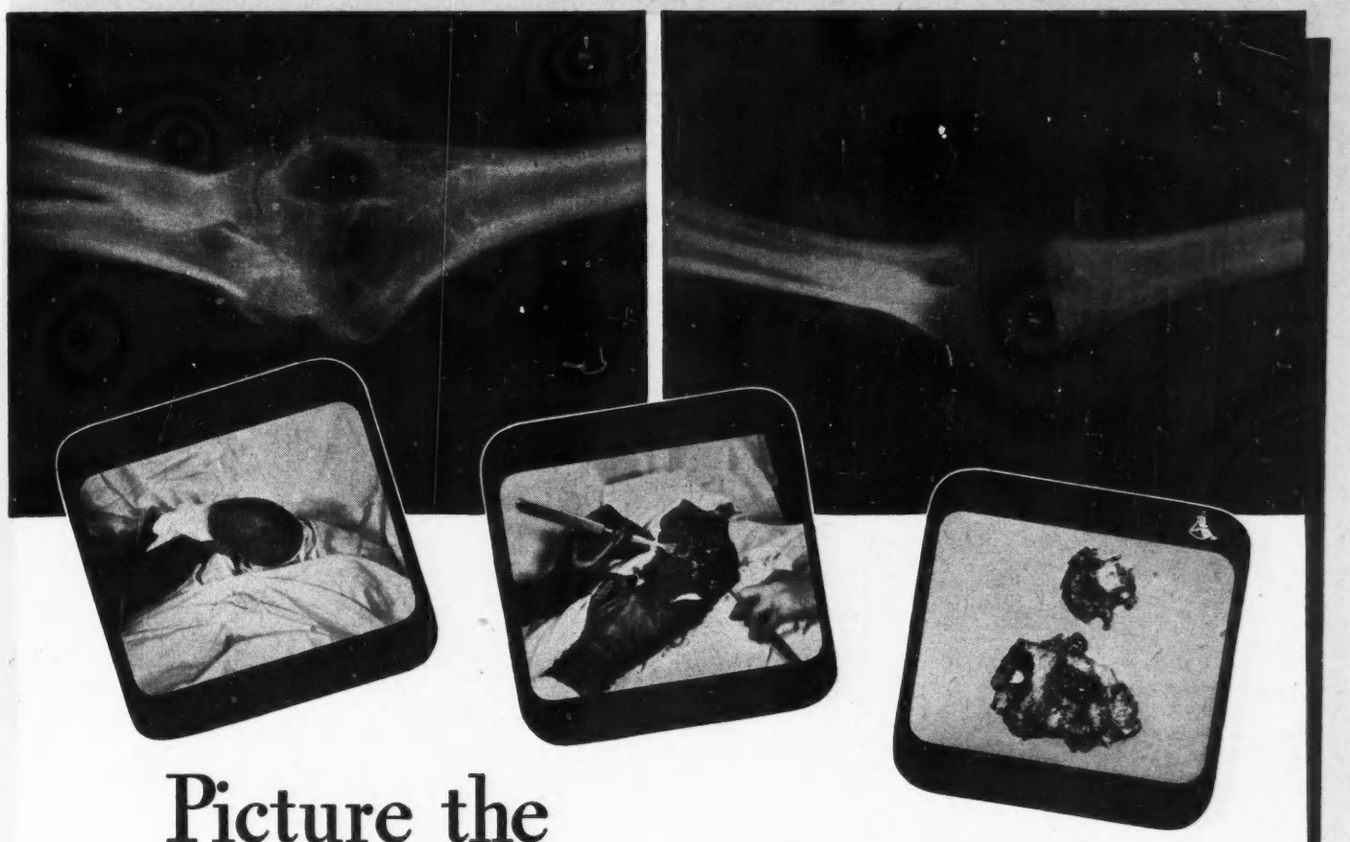
FLOOD RELIEF IN MANITOBA

Doctors everywhere in Canada have been gravely concerned over the disastrous effects of the flood which has inundated so many communities in Southern Manitoba and which has crippled the city of Winnipeg.

The Canadian Medical Association has offered its assistance to the Manitoba Division on behalf of the organized medical profession and as spokesman for individual doctors everywhere. It is now evident that the physicians of Canada can render most effective aid by contributing as individuals to the Manitoba Flood Relief Fund.

Our colleagues in Manitoba have set for themselves an objective of $100,000 to be contributed by the medical profession, and they feel that doctors in other parts of Canada will want to help too.

You can best show your neighbourly feeling to the people of Manitoba by contributing personally to the Manitoba Flood Relief Fund. Donations are being received at the branches of every chartered bank in Canada. The need is urgent and immediate.



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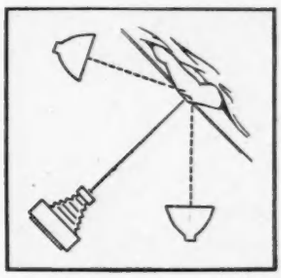

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Book Reviews

Bone and Joint Radiology. E. Markovits, formerly Scientific Collaborator of the Central Radiologic Institute of the General Hospital (Holzknecht-Institute), Vienna. 446 pp., illust. $20.00. Macmillan Co., New York and Toronto, 1949.

This book has been written in a concise and readable outline form unique in this branch of radiology. The author has covered his subject well, dividing it into two parts, the first dealing with general considerations and the latter with the regional radiology of the bones and joints. He has included many differential diagnostic tables which have enhanced the value of this book not only as a text for students but also as a ready reference. This work is recommended for students of radiology and the radiologist as well as clinicians interested in this field of medicine.

Arthritis and Allied Conditions. B. I. Comroe. Edited by J. L. Hollander, Assistant Professor of Physical Medicine, Graduate School of Medicine, University of Pennsylvania. 1108 pp., illust., 4th ed. $18.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1949.

This book has been reorganized into ten parts and most of the chapters have been rewritten in the light of newer knowledge. Every chapter has been revised with the edition of new findings and deletion of obsolete material. The author and collaborators are all specialists in the rheumatic diseases. Most of them are in charge of arthritis clinics and are teachers in this field. Comroe's earlier editions have been in use in all clinics on this continent. It was with satisfaction that we learned that a prominent group of specialists had rewritten, revised and added to the previous edition bringing it up to the minute. The editors were most fortunate in the time of going to press, coinciding as it did with Dr. Philip Hench's report on the revolutionary discovery in the field of rheumatic diseases. The details of the effects of cortisone on arthritis are discussed on pages 489-90. This is a most important discovery and one cannot estimate the stimulating effect it will have on scientific research in the field of arthritis. This composite work, as expected, is much more complete than previous editions though there is not complete agreement on all points. This is probably an advantage as we are shown different angles of the subject.

This is an important book and in view of the recent interest developed in the rheumatic diseases every doctor should have a copy. There is no specialty in arthritis in Canada, so it behooves every doctor to see that his patients do not suffer because of his lack of knowledge of this subject. Use this work as a reference.

Pedigrees of Negro Families. R. R. Gates, Emeritus Professor of Botany in the University of London. 267 pp., illust. $5.50. The Blakiston Co., Philadelphia and Toronto, 1949.

This book is a collection of over 200 pedigrees of negro families mainly from the United States, but also with a few from Canada, British Guiana and the West Indies. The material was collected by members of the negro families themselves, and the pedigrees are published with commentaries by Gates. As so often happens when pedigrees are collected by persons not specifically trained in the work, assumptions are made by the interviewer which leave the reader in doubt as to the veracity of the observations and the accuracy of the material collected. As an example, one pedigree of myopia is given, in which seven generations were reported upon, the male ancestor in the first generation being myopic. He transmitted his defect through six generations to one descendant only in each generation. Such a pedigree brings up the query; how did the collector know that this remote ancestor was "myopic"? Were his prescriptions for glasses, or the glasses themselves available for verification? The same question could be applied to the remaining persons said to be myopic. How did the collector know that all the others in the foregoing generations had normal vision; was it merely because they did not wear glasses? Other pedigrees deal with vague generalities, such as "musical temperament, musical ability, artistic ability", etc. The reviewer does not for a moment doubt that intellectual ability, and special endowments have a genetic basis. Pedigrees depicting inheritance of, "musical ability or artistic ability" are not very valuable, however, unless there is devised some standard by which the degrees of ability may be estimated. To one person, ability to play hymn tunes or to croon, may indicate "musical ability", whereas to another more highly endowed person, such ability would not be listed as worthy of note. "Violent temper" is listed as hereditary. Is there a gene or group of genes determining violent temper, or has there been a failure on the part of the parents to provide the needed discipline? Analysis of the pedigrees is often undertaken but with occasional peculiar results. For example, all interested in the helminth parasites of man.
analysis of one pedigree of "impaired visual perception" results in the statement that "the gene appears to be sex-linked dominant, except that it is recessive in the three carriers". The book is supposed to be dealing with negro pedigrees, but one reads of a family in which "genetic segregation in racial crosses" is evident, and finds a pedigree of blue and brown eye colour (Fig. 207). The final sentence is "This family is apparently of purely white descent". One wonders at its inclusion, since thousands like it could be given by any person observing eye colour, and since it is in a white family, not nego.

There is nothing new in the book except perhaps it be advancement of the theory of three factors determining skin colour in place of the two factor inheritance postulated by Davenport. Much irrelevant detail given by the original negro collectors of the pedigrees is added, and lends nothing to the pedigrees or to the data.

Industrial Toxicology. A. Hamilton, Assistant Professor Emeritus of Industrial Medicine, Harvard School of Public Health, Boston, Mass.; and H. L. Hardy, Physician to the Division of Occupational Hygiene, Massachusetts Department of Labour and Industries. 574 pp., 2nd ed. $7.50. Paul B. Hoeber, Inc., New York, 1949.

This book needs no recommendation. It suffices to say that it is now available. The senior author's "Industrial Poisons in the United States" was one of the extremely few authoritative works on the subject in 1925, and it is still useful in many respects; the first edition of "Industrial Toxicology", published by the senior author nine years later, was a condensed edition of the former, brought up to date and thus particularly useful for medical students and the general practitioner. This, its second edition, is a combination of the two previous works brought up to date. The list of carefully selected references to the literature—over 1,400—alone make the book valuable for teachers, research workers in toxicology and industrial physicians. The extent to which the book has been brought up to date is seen in the references to BAL in arsenic, mercury, gold, cadmium and tellurium poisoning; in the description of nitrite-thiocyanate treatment of acute cyanide poisoning; the ultra-violet test for porphyrin in urine in occupational lead poisoning; clarification of the previously much disputed chronic carbon monoxide poisoning; recognition of possible sequelæ of acute carbon monoxide poisoning, in spite of complete recovery from unconsciousness; toxicological hazards in the manufacture and handling of D.D.T. and even of stilbœstrol. The book also includes new chemical agents in the petroleum series and also in the benzene series and, fitting in with the rapidly increasing uses of beryllium, an entire chapter is devoted to this element. Still further enhancing the value of the book is an entire chapter on "Radiant Energy" which deals with radio-active iso-

topes and the hazards from the new developments about atomic energy in general. No teacher or research worker in industrial toxicology and no industrial physician can afford to be without this book.

Human Helminthology. E. C. Faust, The William Vincent Professor of Tropical Diseases and Hygiene, Head of the Division of Parasitology, Department of Tropical Medicine and Public Health, The Tulane University of Louisiana, New Orleans, Louisiana. 744 pp., illust., 3rd ed. $11.25. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Limited, Toronto, 1949.

The third edition of Faust's well known textbook has been completely revised and brought up to date to incorporate the considerable amount of new information on worm parasites that accrued during the war—especially concerning far Eastern schistosomiasis and filariasis. The sections on technique have also been enlarged, and a glossary of terms added. However, basically the text follows the now well-established lines of previous editions and it remains the single book of references for

Atlas of Roentgenographic Positions. V. Merrill. Vol. 1, 291 pp., illust. Vol. 2, 372 pp., illust. $30.00. C. V. Mosby Co., St. Louis, 1949.

This work which is concerned with positioning only, was written as a reference for x-ray technicians. There is a short introductory chapter on general radiographic technique and the relationship of the technician to the x-ray department, equipment and to the patient. The succeeding chapters deal regionally with the examination of the patient and each is introduced with a short discussion of the anatomy of this region. This is followed by a written description of each positioning technique accompanied on the same page by a photographic presentation of the position as well as a reproduction of the resultant radiograph and a short note on the main structures so visualized. The author has covered the standard and the most frequently used special positions as well as some of the more unusual ones. The format of the book is excellent, it is well printed and the photographs are clear but the reproductions of the radiographs are not as good as they should be. There is both a complete table of contents and a complete index in both volumes as well as a considerable bibliography. This atlas, although written primarily for technicians, will be found a useful reference by many radiologists.

A Psychiatrist Looks at Tuberculosis. E. Wittkower, Psychiatrist to the Skin Department, Saint Bartholomew's Hospital, London. 152 pp. The National Association for the Prevention of Tuberculosis, London, W.C.1, 1949.

In this book Dr. Wittkower discusses his study of 785 tuberculous patients who were given a psychiatric examination. The book is divided into three parts, one dealing with the behaviour of tuberculous patients, one with factors determining this behaviour, and one with the relevance of emotional factors in the cause and course of the disease. The language employed by Dr. Wittkower is English, a tongue which he uses with brevity and clarity as an instrument of expression; in this respect the book differs from much of latter day medical writing. The book contains a fascinating study. In the first two chapters, which are concerned with the emotional reaction of the patient to symptoms, to diagnosis, and to the illness, and with the patient himself and his environment, a number of conclusions are reached. Most may appear reasonable and many will seem familiar. To many readers, however, even those working with tuberculosis, the conclusions will be encountered for the first time in statistical form.

Undoubtedly the most interesting part of the book is the third chapter. It is devoted to the suggestion that emotional factors frequently precede—and probably precipitate—the onset of tuberculosis. The author offers a psychopathological hypothesis, which he introduces with the quotation, "Sometimes it is more important to know what kind of a fellah has a germ than what kind of a germ has a fellah." Also, it must be noted, it is important to compare the results of any study with a group of controls, the absence of which is conceded by the author with evident regret.

Design and Equipment of Hospitals. R. Ward. 360 pp., illust. $10.50. Baillière, Tindall & Cox, London, W.C.2; Macmillan Co. of Canada Ltd., Toronto, 1949.

We are now experiencing an unprecedented wave of hospital construction, and committees of hospital trustees and staff physicians are turning their attention to the cardinal principles and factors in good functional designing. It is vitally important that the many new hospitals, now at the draughting board stage, be properly designed, not only to take advantage of the many new ideas developed in recent years but to permit adaptation to the changing functions of hospitals which are almost certain to accompany the social legislation gradually taking shape about us.

This excellent volume contains a wealth of valuable information. The section on General Considerations would be of much help to building committees. Throughout it is obvious that the author has kept *function* in mind, a consideration sometimes subordinated to attractive design. The various services and departments and the different buildings are dealt with in turn.

There is a tendency in this country to adopt American principles in design and construction, and to use, in large part, American type equipment. In some instances this may be due to closer contact and familiarity and, in other instances, to the better adaptation of American design to our climatic needs and social customs. There has been a dearth of British literature on construction, as compared to the extensive American literature, and we welcome this volume as providing an opportunity for our hospitals architects and building committees to gain a closer insight into the best of British thinking on this subject. Some features discussed would not be applicable here, as, for instance, a porter's lodge. Also, because of the relative maintenance cost of labour versus mechanical equipment and such factors as heating and parking problems, we have favoured vertical construction as against horizontal construction (except in smaller hospitals) and a much greater installation of plumbing. Despite the title, equipment is not dealt with (to any extent) except for fixed equipment. The illustrations are good and to the point.

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Books Received

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Books are acknowledged as received, but in some cases reviews will also be made in later issues.

Physiology of the Eye. Vol. 1. Optics. A. Linksz, Manhattan Eye, Ear and Throat Hospital. 334 pp., illust. $9.50. Grune & Stratton, New York; The Ryerson Press, Toronto, 1950.

Breast Deformities and their Repair. J. W. Maliniac, Clinical Professor of Plastic Reparative Surgery and Associate Attending Plastic Reparative Surgeon, New York Polyclinic Medical School and Hospital, New York City. 193 pp., illust. $12.00. Grune & Stratton, New York; The Ryerson Press, Toronto, 1950.

Introduction to the Study of Experimental Medicine. C. Bernard. 226 pp. $3.50. Henry Schuman Inc., New York, 1949.

Diseases of the Foot. E. D. W. Hauser, Associate Professor of Bone and Joint Surgery, Northwestern University Medical School. 415 pp., illust., 2nd ed. $8.00. W. B. Saunders Co., Philadelphia and London; McAinsh & Co., Ltd., Toronto, 1950.

Advances in Surgery. Vol. 2. William DeWitt Andrus, Chairman, *et al.* 590 pp., illust. $11.00. Interscience Publishers, Inc., New York, 1949.

This is Race. Edited by E. W. Count. 747 pp. $7.50. Henry Schuman, Inc., New York, 1950.

Rehabilitation, Re-education and Remedial Exercises. O. F. G. Smith, formerly Principal of the Swedish Institute, London. 456 pp., illust. $4.75. Baillière, Tindall & Cox, London; Macmillan Co. of Canada, Toronto, 1949.

Urologic Roentgenology. M. B. Wesson, Past President, American Urological Assocaition. 282 p.p., illust., 3rd ed. $9.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

Office Orthopædics. L. Cozen, Attending Orthopædic Staff: The Orthopædic Hospital, Veterans' Hospital, Los Angeles. 232 pp., illust. $6.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada, Toronto, 1950.

Children with Mental and Physical Handicaps. J. E. W. Wallin, Visiting Professor of Clinical Psychology, Upsala College. 549 pp., illust. $6.65. Prentice-Hall, Inc., New York, 1949.

Ankylosing Spondylitis. Part I. F. Hernaman-Johnson, Physician to the Charterhouse Rheumatism Clinic. Part II. W. A. Law, Assistant Surgeon, Orthopædic Department, The London Hospital. 200 pp., illust. $6.25. Butterworth & Co. (Publishers) Ltd., London and Toronto, 1949.

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Books Received

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The Yellow Emperor's Classic of Internal Medicine. Huang Ti Nei Ching Su Wen. Chapters 1 to 34 translated from the Chinese with an Introductory Study by I. Veith, Lecturer in the History of Medicine, the University of Chicago. 253 pp., illust. $5.00. Williams & Wilkins Co., Baltimore; Burns & McEachern, Toronto, 1949.

Atlas of Human Sex Anatomy. R. L. Dickinson. 145 pp., illust., 2nd ed. $10.00. The Williams & Wilkins Co., Baltimore, 1949.

Stern's Applied Dietetics. Revised by H. Rosenthal, Chief of Frances Stern Food Clinic, the Boston Dispensary; P. C. Baker, former Associate, Frances Stern Food Clinic, the Boston Dispensary; and W. A. McVey, Assistant in Medicine, Tufts College Medical School. 293 pp., illust., 3rd ed. $5.00. The Williams & Wilkins Co., Baltimore, 1949.

The Surgical Treatment of Facial Injuries. V. H. Kazanjian, Professor Emeritus of Plastic Surgery, Harvard University; and J. M. Converse, Assistant Professor of Clinical Surgery (Plastic Surgery), New York University College of Medicine. 574 pp., illust. $10.00. The Williams & Wilkins Co., Baltimore, 1949.

Handbook of Surgical Urology for Interns, Hospital Corpsmen and Nurses. N. F. Ockerblad, Professor of Clinical Urology, University of Kansas School of Medicine. 189 pp., illust. $3.00. The Williams & Wilkins Co., Baltimore, 1949.

Vitaminology. W. H. Eddy, Emeritus Professor of Physiological Chemistry, Teachers College, Columbia University and Scientific Director, American Chlorophyll Inc. 365 pp. $6.00. The Williams & Wilkins Co., Baltimore, 1949.

Year Book of General Surgery, 1949. Edited by E. A. Graham, Professor of Surgery, Washington University School of Medicine. 707 pp., illust. $4.75. The Year Book Publishers Inc., Chicago.

Medical Diseases of the Kidney. J. F. A. McManus, Associate Professor of Pathology, the Medical College of Alabama, Birmingham. 176 pp., illust. $7.20. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1950.

Clinical Radiation Therapy. Edited by E. A. Pohle, Professor of Radiology, Chairman, Department of Radiology, University of Wisconsin, Madison. 902 pp., illust., 2nd ed. $18.00. Lea & Febiger, Philadelphia; Macmillan Co. of Canada Ltd., Toronto, 1950.

Diseases of the Aorta. N. E. Reich, Associate in Medicine, Long Island College of Medicine. 288 pp., illust. $7.50. Macmillan Co., New York and Toronto, 1949.

Metabolism and Function. Edited by D. Nachmansohn. 348 pp., illust. $7.00. Elsevier Publishing Co., Inc., New York, Amsterdam, London, Brussels, 1950.

Medical State Board Questions and Answers. R. M. Goepp, formerly Professor of Clinical Medicine, Graduate School of the University of Pennsylvania; and H. F. Flippin, Associate Professor of Medicine at the Graduate School of the University of Pennsylvania. 663 pp. $8.00. W. B. Saunders Co., Philadelphia; McAinsh & Co. Ltd., Toronto, 1950.

Electrocardiography. L. Wolff, Visiting Physician, Consultant in Cardiology and Chief of the Electrocardiographic Laboratory, Beth Israel Hospital. 187 pp., illust. $5.25. W. B. Saunders Co., Philadelphia; McAinsh & Co. Ltd., Toronto, 1950.

Intestinal Intubation. M. O. Cantor, Assistant Attending Surgeon, Grace Hospital. 333 pp., illust. $9.00. Charles C. Thomas, Springfield; The Ryerson Press, Toronto, 1949.

Hæmolytic Disease of the Newborn. M. M. Pickles, Nuffield Graduate Assistant in Clinical Pathology, Radcliffe Infirmary, Oxford. 181 pp., illust. $6.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1949.

Helpful Hints to the Diabetic. W. S. Collens, Chief of the Diabetic Clinic, Maimonides Hospital; and L. C. Boas, Chief of the Diabetic Clinic, Greenpoint Hospital, Brooklyn, N.Y. 135 pp., illust. $3.50. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1949.

The Canadian Formulary 1949. 96 pp., 7th ed. The Canadian Pharmaceutical Association, Toronto.

Therapeutic Exercises. H. Kraus, Assistant Clinical Professor of Rehabilitation and Physical Medicine, New York University College of Medicine. 309 pp., illust. $7.25. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1949.

Congenital Anomalies of the Heart and Great Vessels. T. J. Dry, Consulting Physician in Division of Medicine, Mayo Clinic *et al.* 68 pp., illust. $6.00. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1948.

External Morphology of the Primate Brain. C. J. Connolly, Professor of Physical Anthropology, Catholic University of America, Washington. 378 pp., illust. $12.00. Charles C. Thomas, Springfield, Ill.; The Ryerson Press, Toronto, 1950.

The Common Infectious Diseases. H. S. Banks, Physician-Superintendent, Park Hospital, Hither Green, London. 354 pp., illust. $4.00. Edward Arnold & Co., London; Macmillan Co. of Canada Ltd., Toronto, 1949.